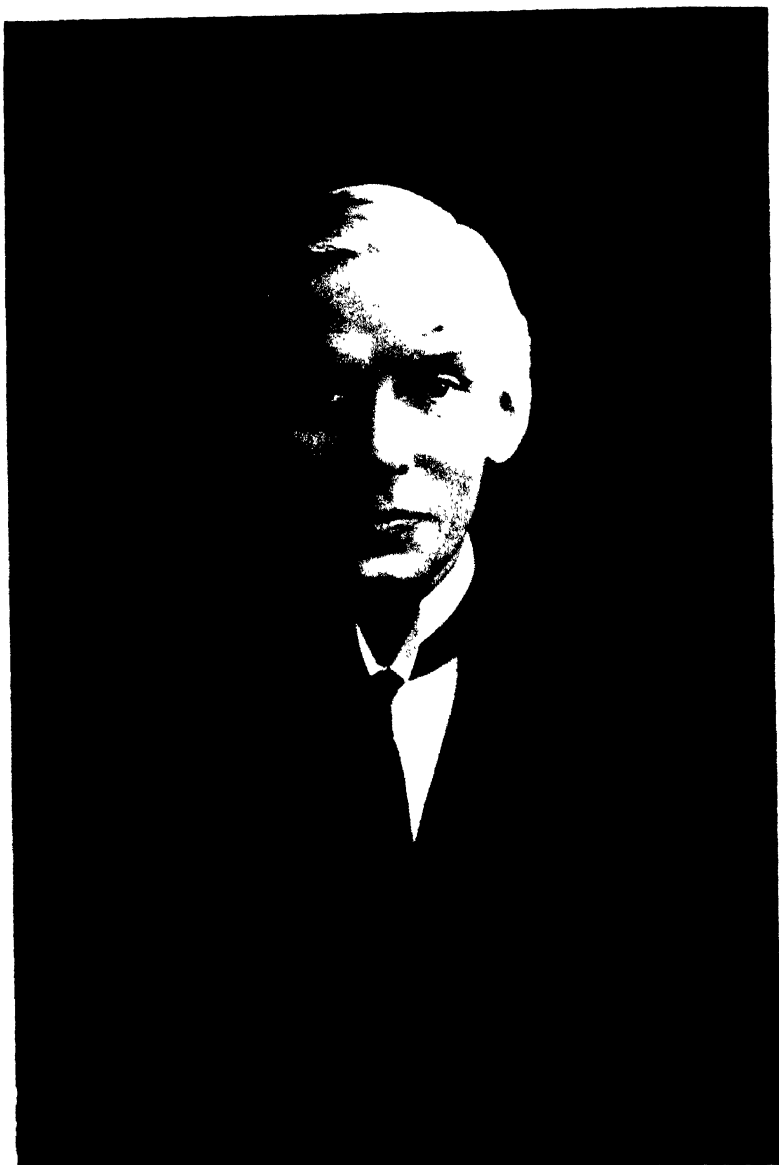


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POLITICS FROM WITHIN
1911-1918



POLITICS FROM WITHIN 1911-1918

INCLUDING SOME RECORDS OF
A GREAT NATIONAL EFFORT
BY THE

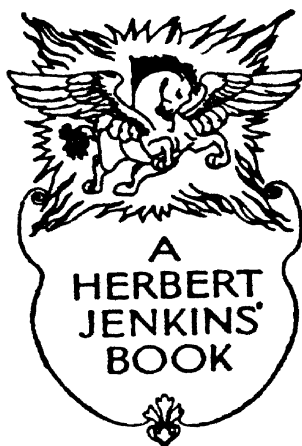
RT. HON. CHRISTOPHER ADDISON

FORMERLY UNDER-SECRETARY AT THE BOARD OF
EDUCATION AND AT THE MINISTRY OF MUNITIONS.
LATER, IN SUCCESSION, MINISTER OF MUNITIONS,
OF RECONSTRUCTION, AND OF HEALTH

WITH A FOREWORD BY THE
RT. HON. LORD CARSON

VOLUME I

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To
MY WIFE AND CHILDREN

INTRODUCTORY NOTE

THIS book is not an attempt to describe the military operations of the war, or to offer an amateur's opinion upon their conduct. It is not designed to make a case either for or against any man or policy. It is a plain tale of men and events as I knew of them myself, and it relates particularly to political affairs and to the civil and ministerial side of our efforts during the war.

It so happens that I was one of the group of five men who held government office throughout the whole period of the war, and the book is founded upon notes and memoranda made at the time, but care has been taken to avoid either the disclosure or the suggestion of matters in which the preservation of secrecy is of national importance. At the beginning of the war I decided, if I could, to keep a faithful diary, and by the aid of Miss M. M. White, O.B.E. (now Mrs. McVittie), who was my confidential Secretary throughout, I succeeded in doing so. In particular also I am indebted to Mr. H. H. Piggott, C.B., and to Mr. M. Heseltine, C.B., who were my official Secretaries when Minister of Munitions, for invaluable notes and digests on the work at that Ministry. Later on at the Ministry of Reconstruction, and until the general election of 1918, Mr. P. Barter, C.B., was my Secretary and rendered the same efficient and ungrudging help.

Many of those who worked with me during the war period have provided memoranda that have been of much service, and I have endeavoured throughout to make free acknowledgments. It is not possible fully to express what our country owes to that great band of men and women who came to our assistance during those years. They were leaders in art, industry, medicine, labour, law, literature, science, and in almost every branch of life wherein people come to the front by personal worth and service.

CHRISTOPHER ADDISON.

FOREWORD

THE outbreak of the Great War which threatened the liberties of Europe had many and varied results, but perhaps the most gratifying was the way in which those of us who were desperately divided in our political views at once made friends and closed up our ranks in the grim determination that at all costs the British Empire must put forth its utmost efforts to win right through in the battle for freedom and civilisation.

The author of this book was an old political opponent always respected by me for his deep sincerity in the cause of all legislation brought forward for the alleviation of the lot of the poorer and more helpless classes of the community—a respect which turned into, I think I may say a friendship, from the closer connections that brought us together when we were doing all in our power to aid the organisation at home which enabled our brave armies in the field to carry on with the fullest equipment of all that was necessary to make our forces effective. Indeed, the fact that the author has asked me to write a Foreword is the best evidence of the mutual confidence which has grown up and continued down to the present time.

The conversion of the resources and industries of this country, the great exemplar of peaceful progress, and therefore unfortunately, or perhaps naturally, totally unprepared for war of any magnitude, was a task of such a gigantic nature that it is only those, and they were many, who were engaged in and had the responsibility for its fulfilment, who can fully realise the great transformation which was effected, and the many moments through which the country passed when even the bravest and most optimistic might have wavered under the heavy and ever-increasing burthens cast upon us. How easily we say, "England and the Empire put five to seven millions of men into the field," while never for a moment reflecting what that meant in the way of revolutionising our whole life at home, the transformation of all our industries and commerce, the feeding of our population and the continuance of our factories with all the best and strongest recruited for the trenches. Verily it is a romance of organisation and determination which has never been surpassed!

The author of this book was one of the few men who held Government office of importance and grave responsibility during the whole period of the war, and the following pages may therefore be accepted as the record of one behind the scenes who is able to give to the world a genuine picture. To attempt any summary of the contents of this contribution to the history of the war would be futile. The state of politics at the outbreak of the war, the events leading up to it, are all dealt with impartially and faithfully—but it is the part taken by the author in the vast organisation that was evolved which will chiefly arrest the reader.

To invite the most scientific brains in the country to such research as would turn to the best advantage such materials as we had with a view to producing everything necessary for our armies in the field was probably one of the most important events in the early history of the war, and the results achieved by the Committee of Scientific and Industrial Research and the Medical Research Committee, with the institution of which the author was so closely identified, were such as to justify both these organisations taking a permanent place as part of our National machinery under the Privy Council.

The story of the creation and work of the Ministry of Munitions, which played so important a part in the ultimate success of the war, is told with first-hand knowledge, the author having filled first the office of Under-Secretary and afterwards that of Minister of Munitions. It would be useless to attempt in a Foreword any description of the extraordinary and exceptional success of this department. I can only express my own thanks to the author for the energy, capacity and enthusiasm with which, when I was First Lord of the Admiralty, he took up the question of production of mines for this department—a branch of defence and offence which had been too long neglected and in which we were so much inferior to the Germans. Here you find the full story of guns, ammunition, rifles, machine guns, trench warfare supplies, explosives, tanks, and the development of their manufacture. Those who, accustomed and trained in the policy of peace had thought in hundreds, had to think in millions, and elaborate the necessary schemes for turning the whole country into a veritable arsenal of destructive engines and materials.

There are, however, many and varied subjects outside this great task in which the author played a part and treats of in these interesting pages. Ireland, always a difficulty, and the attempt to bring about a settlement; the threatened famine by reason of the sinking of our vessels by the German submarines, and how the dangers were overcome, are all recounted with first-hand know-

ledge. Indeed the reader will find in this book the fullest and most complete revelation of all the difficulties which were surmounted at home as a result of which our valiant troops were enabled to finally drive back the aggressors and make secure the peace of the world.

This book fills a necessary place in the history of the World's War, and those who come after us and read of the efforts of a nation trained in peace at all costs to repel and conquer the greatest military organisation that has ever existed, will be proud to think the whole Empire rose with all its might in a great and sustained effort to secure for the world the preservation of its liberty and freedom.

CARSON OF DUNCAIRN.

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POLITICS FROM WITHIN

CHAPTER I

A PRIVATE MEMBER, 1910-14 THE INSURANCE ACT CONTROVERSY AND HEALTH SERVICES

A Private Member—The Insurance Bill—First Meeting with Lloyd George—Morant and other Civil Servants—Growing Opposition—The Fight over the Act—Tuberculosis Schemes—Origin of the Medical Research Committee—Struggles of Research Workers—Moulton—Work for Lloyd George—Health Services in the Budget of 1914—Morant and Newman—Haldane and Masterman.

LIFE in the House of Commons is largely what a man makes it for himself. Some men come into it almost by chance, and some get so tired of it that nothing will induce them to seek re-election.

But the great majority of members become deeply attached to it, and, once attracted, there is no shaking off the spell and fascination which the whole place with its dignities and its ancient traditions weaves around its lovers. The building itself seems to live, and like some wise and tolerant Spirit receives the unfolding present and, sifting the great things from the small and mean, stores them in its vast chamber-house of memory.

It is also, in the assembly of its members, the most interesting of places. New elections seem to make little difference to the mass effect. It does not matter what subject arises, there is sure to be someone there who knows all about it, and if he can be found in a quiet corner and in the mood, he will talk freely and will give you a glimpse, perhaps, of a world of interesting realities in which he has spent his life and which to you was hitherto an unknown region behind a form of words. It is also the kindest, fairest, although perhaps the most critical, assembly in the world. Whether you are rich or poor, a lord or a navvy, makes no difference: you are taken for what you are, and treated accordingly. It honours worth and ignores trimmings, and I have often seen it treat bombast with cruel but just severity.

Attendance at the House may become very tedious unless a man

finds for himself something interesting to do within its precincts. It must be a dreary business simply to hang about the corridors and smoke-rooms in order to keep a majority for the Whips; and it has been demoralising to some men. Personally, I became a candidate for Parliament because I was interested in certain social and health subjects, and I found plenty of occupation as a private member from 1910 to 1914.

Some men are attracted by the semi-judicial work of the small committees on local legislation and private Bills, and a few of them, like Sir Park Goff and Sir William Middlebrook, who have worked for years on these local Bills, have never had their labours appreciated as they deserve to be because their proceedings do not come before the House as a whole.

The most fascinating work of all to me was on the larger committees that meet upstairs on government and other Bills. This may be because, first as a private member, and later as a minister, I had more than an ordinary share of it. In the latter capacity it fell to my lot to conduct an unusually large number of Bills through these committees in the crowded years that followed the war. Forty or fifty members, at least, will usually take an active interest in a Bill; they become closely associated and get to know one another better on these committees than anywhere else. Things are discussed there on their merits much more than in the House itself, and active whipping is rarely required.

Parliament has still to devise a satisfactory way of dealing with Bills promoted by private members. Almost every Session there are some which relate to small but definite reforms that are generally desired, but the fortune of the ballot and the pressure of government business scarcely gives more than 1 per cent. of them a chance of getting through. The Daylight Saving Bill devised by Mr. Willett and so consistently brought forward year after year by the late Mr. Pearce, member for the Leek Division, is a good example. I made only one attempt myself, and although my one-clause Bill never got a second reading, it gave me two serviceable lessons and happily led to something useful being done. In those days we had attempted little or nothing in an intelligent way to remove the chief cause of infantile mortality and sickness, namely, the popular ignorance of the simple essentials of infant feeding. Since then we have had a great development of maternity and child-welfare centres, and the process has gone far beyond the provisions of my Bill, which simply proposed that older girls in schools should receive elementary instruction in the care of infants.—It is only by instructing the mothers of the future, as yet uninfluenced by traditions, that we can remove those age-long prejudices which lead to newly-born

infants being dosed with gruel and unsuitable foods.—After a few nights of moving the second reading at eleven o'clock the objectors were reduced to Sir Frederick (now Lord) Banbury, and the first lesson I learnt was that even the most hardened obstructionist is very human. I did not know Banbury myself, but in Major John Baird (lately Under-Secretary to the Home Office) I had a friend in need in the Conservative ranks, and he took me to Banbury and tried to reason with him. Banbury's principle, as explained with charming lucidity, amounted to this: "Addison, you are a Radical. It is therefore ten to one that your proposal is a bad one and ought to be objected to. If by any wonderful chance it is a good one, it is a bad thing that any Radical should get credit, and on that ground it should still be objected to." There was no loophole in this logic, but Baird persuaded Banbury of the merits of the proposal by a description which, I am afraid, had little relation to the Bill itself, and was in terms that are scarcely suitable for popular repetition. But it attained its object, and Banbury promised not to object the next evening. This brought the second House of Commons lesson. To my amazement, the following evening, finding nobody else to object, Mr. John Gulland, as Whip, himself rose to do so. I lost no time in seeking an explanation, and Gulland told me, in answer to my expostulations and animadversions on the Government's professed solicitude for child welfare, that he was merely carrying out instructions from the Board of Education. Investigating the matter a little further, therefore, I found a great enthusiasm for the proposal at the Board, but all sorts of reasons for not adopting it. They said it could not be put in the Code; the teachers themselves had not been instructed, and so on. There was substance in the last objection, and the outcome was that instruction in this group of subjects was made obligatory in the training of women teachers, on the understanding that, as soon as practicable, it should be introduced into the senior classes.—This has long since been done.

Except in the case of very fine debaters, talking does not count for much in the House of Commons; but if a man knows what he is talking about and speaks only when he has something to say, the House will listen to him with attention. A great many men certainly spoil their political career by perpetual intervention in debate, but temptations of that kind never assailed me, for I knew that I possessed no oratorical abilities, and I found sufficient opportunity in the group of subjects of which I had some knowledge. It so happened that during the years 1911 to 1914 these subjects were very prominent, and through them I came into close association with many ministers. This applied particularly to Mr. Lloyd

George, who, at that time, was Chancellor of the Exchequer.

My acquaintance with him began through a casual conversation with Mr. C. F. G. Masterman. It was just after the National Health Insurance Bill had been introduced and whilst it still had favourable treatment from public opinion and the Press. Masterman was then Secretary to the Treasury, and had helped Lloyd George in the framing of the Bill. "Well, what do you think of our Insurance Bill?" he asked me, one day, when I came into the smoke-room after lunch. I said, in effect: "The intention is fine; but if you try to put the health provisions into operation as they now are, the 'fat will be in the fire' from Land's End to John o' Groats." He was a good deal taken aback at this reply, and said it would be a good thing if I could tell the Chancellor what I thought about it, and give my reasons. In the evening he called me from my usual back bench and took me to the room at the top of the stairs behind the Speaker's chair that Lloyd George occupied for many years and for which, I think, he had a great affection. In later days this room was subdivided, and Mr. J. T. Davies, his private secretary, was the presiding genius of the piece partitioned off—greeting the welcome and skilfully fencing off the unwelcome. I have no doubt that on this my first occasion of entering it Lloyd George greeted me with a smile, half-turned in his chair to the door, as was his usual attitude. In substance he said: "Masterman has told me a horrible tale of what you say about the Insurance Bill. Let me hear it again." I explained to him that under the Bill as it then stood the medical attendance and treatment of eight or ten million people would be worked as an extension of the existing club-system; that the club-system, although it applied to quite a small proportion of the population, simply stank in the nostrils of the whole medical profession, and that if he tried to impose it on them he would find them solid to a man against it. I added that I should do everything I could to back them up, for we should never get a proper health system established in the country on those lines. I was as good as my word, for I canvassed nearly every member of the House of Commons against the proposal.

These incidents marked the beginning of a long period of close and intimate work with Lloyd George, for, with characteristic alertness, he was quick in seeking alternative suggestions. He decided, finally, to leave the issue I raised to a free vote of the House. The result came a few weeks afterwards in Committee, when, by an overwhelming majority, on my amendment, the administration of medical benefit was transferred from the Approved Societies to the Insurance Committees—an amendment which effected a transformation in the whole scheme of the Bill. The Society system of control



Photo by F. Ingley

THE LATE SIR ROBERT MORANT, K.C.B.

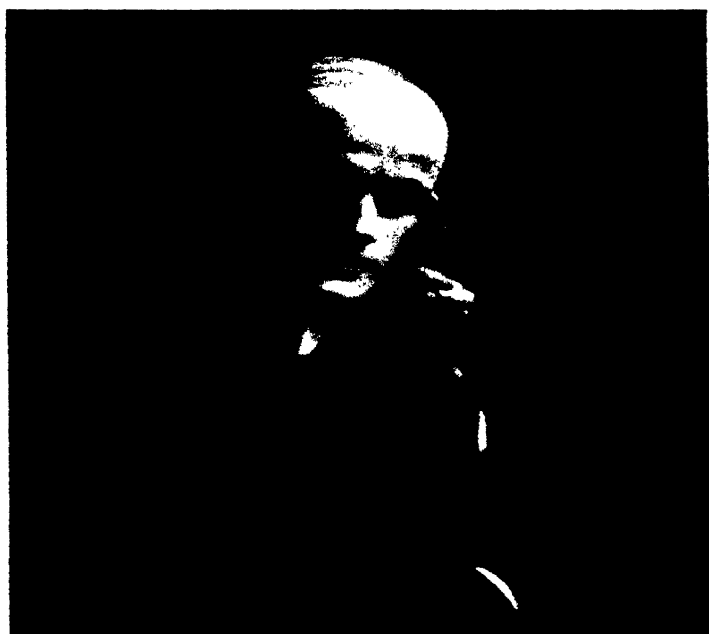


Photo by F. Ingley

SIR W. M. FLETCHER, M.D., F.R.S.

was swept away, and a complete modification of the constitution of the Insurance Committees, with many other changes that need not be particularised, was called for. The change was received with immense relief by the medical profession, and provided me with a first experience of the ups and downs of public life. At first, congratulations and messages of encouragement came in by the multitude, but as the agitation against the Act grew in power the tone began to change, and a generous measure of vituperation was afterwards dealt out to me for supporting the Act, even as amended. With regard to the amendment, I think it does not often happen that a private member's motion against a government proposal is carried by such an enormous majority. The figures were—

For . . 387

Against 15

The introduction of the Insurance Act into operation was a prodigious task, and Lloyd George enlisted some of the ablest and most alert members of the Civil Service. There was need of them. The enrolment of ten million or more workers into approved societies and the creation of all the machinery of administration and of the collection and allotment of contributions involved immense detail in organisation and the improvisation of a thousand expedients. It had to be done in the face of a campaign of opposition that was daily growing in intensity. There were monster petitions against the Act, organised protests against "stamp-licking," an outcry over domestic servants, and a steady whipping up of opposition in the medical profession. On the whole, it was as desperate and difficult a public undertaking as any that I have knowledge of. It was touch-and-go more than once. The hostile Press campaign failed badly over the commencement of compulsory contributions (then known as "stamp-licking"), but it nearly succeeded in preventing the inauguration of medical benefit in January, 1913.

No account of these struggles, however brief, is possible unless reference is made to the men who directed operations. The case itself and Lloyd George's own influence were most important, but they alone would have been insufficient against the difficulties of the task. Practically all the outstanding men in the Civil Service were brought in, at one time or another, to lend a hand, but the late Sir Robert Morant, K.C.B., was captain of the working crew. He was a magnificent and ruthless hustler, if ever there was one. Physically a tall man, with a big head and a clear, determined face, he looked what he was—great in mind as well as in body. He visualised the task in all its detailed application; he saw before him the millions of enrolments, the forms and apparatus required, and even seemed to have sorted out duties to different groups of men

before we had left the room where we had been discussing them.

Morant attracted to himself a remarkable group of men, and we have only to glance at the names of some of them and at the positions they now occupy to realise the quality of his discernment.

His Chief Assistants were: Bradbury, from the Treasury (Sir John Bradbury, the British Member of the Reparations Commission); Sir John Anderson (afterwards Secretary of the Ministry of Shipping and now Under-Secretary of the Home Office); Sir Claud Schuster (now Secretary of the Lord Chancellor's Office); Mr. J. W. Braithwaite (now Commissioner of Inland Revenue); Sir Aubrey Symonds (now one of the Secretaries of the Ministry of Health); Sir J. A. Salter (in charge of the Economic Section of the League of Nations, and Director of Ship Requisitioning during the War); Mr. S. P. Vivian (now the Registrar-General); and Mr. L. G. Brock (Assistant Secretary to the Ministry of Health).

It was not long before Dr. Smith Whittaker, formerly Secretary of the British Medical Association, was enrolled, and his appointment gave rise to a great outcry, but it justified itself many times over. Later on, the separate National Commissioners¹ joined us, but the head and front of the whole organisation was Morant.

For my part, after having carried the original amendment and pledged myself to do what I could to make the Act workable, I was gradually brought into council more and more. From day to day as the conferences went on, and one difficulty after another emerged, Morant and his men seemed to be ready, even at a few hours' notice, to produce considered proposals for meeting them. It was the first insight I ever had into the quality of the men in the Civil Service. Admittedly these were selected men and it was a special occasion, but it effectually dispelled any notion I might have had that Civil Servants were so swathed in red-tape and tradition that they had no disposition to undertake experiments. No business man or pioneer could have employed a greater succession of novel, and indeed audacious, expedients for getting over our difficulties than one or another of these men suggested from day to day. We had, of course, in Lloyd George, who was present at the important discussions, a man who was fighting one of the greatest political battles of his life, and who has at all times a remarkable readiness to discern the usefulness of any suggested device, but Morant and the staff of men who saw this great undertaking through, made an impression upon me of their capacity and resource that runs like a refrain through all the notes of the stirring incidents of the time.

¹ The Chief Commissioners were: Sir James Leishman and Dr. J. C. McVail for Scotland; Sir Walter Kinnear and Sir J. A. Glynn for Ireland; and Sir T. J. Hughes and Dr. Meredith Richards for Wales.

The collection of contributions and the enrolment of the insured into societies were accomplished with much greater ease than had been anticipated, but it was enormously facilitated by the enlistment of the immense machinery and administrative experience of the industrial approved societies. Their agencies penetrated every street in the towns and every village throughout the land, and were invaluable in combating the vehement campaign against the Act. The dramatic declarations of certain duchesses that they would "never, never lick stamps" for domestic servants had the effect, I think, of rallying masses of people to our side. In a spirit of mischief almost, it was decided to notify a certain duchess, who had been particularly prominent in the outcry, that an inspector would call to examine the servants' cards. Whether by accident or design, it so happened that the inspector was buttonholed on his arrival, and was seen by the duke, who showed him the cards stamped and in order.

The greatest danger of all arose over the introduction of medical benefit in January, 1913, and the whole strength of the opposition was directed to produce a breakdown in this vital matter. Many of the amendments to the Bill had been well received by the medical profession, but the question of remuneration was long undetermined, and the dispute over it provided an opportunity for those who objected to the Act altogether. The sum of six shillings per insured person, as originally set apart, was clearly insufficient, though the Act was providing for medical treatment in the home only. But this was the essential beginning of any satisfactory system, and provided a basis upon which an improved system might gradually be built up as experience developed. This was the thing worth fighting for and which brought several of us together in the spring of 1912.

Sir William Plender, the Actuary, at the request of the Treasury and with the concurrence of the British Medical Association, had conducted an investigation into the question of remuneration, but the attacks on the Act became so vehement that, although remuneration was not decided, the British Medical Association withdrew their representatives and called upon other medical men to resign from the Advisory Committee. Fourteen of us declined to do so,¹

¹ The Members who refused to resign were as follows—

Dr. Christopher Addison.	Herbert Jones, Esq., F.R.C.S.
Sir Clifford Allbutt, F.R.S.	Arthur Latham, F.R.C.P.
Dr. Clement Belcher.	Dr. H. H. Mills.
Sir C. J. Bond, F.R.C.S.	Sir Shirley F. Murphy.
Sir John Collicie, M.D.	Dr. George Reid.
Dr. Adam Hamilton.	Dr. John Robertson.
Dr. M. St. L. Harford.	Sir G. Sims Woodhead, F.R.S.

and that event, I think, marked the turning-point in the struggle, for the request was obviously unreasonable.

Some of us were resolved, if we could, to secure the working of the Act in the face of any opposition provided fair terms were obtained for the medical men, and we soon got together a fairly efficient campaign organisation. In the struggle to which we were committed two men (Dr. H. H. Mills, of Kensington, and Dr. Lauriston Shaw, one of the physicians at Guy's Hospital) stand out in my recollections as prominent for courage and ability. The opposition and opprobrium which these high-minded men endured, although they were by no means alone in that respect, was shameful and discreditable to the last degree. If ever men deserved well both of the profession and of the public, these two did. Their endeavour was to prevent the profession being committed, with all the misfortunes to itself and to the public that would certainly have ensued, to a refusal to co-operate with the State in a great endeavour. It was not so difficult a matter as we anticipated, and our campaigning organisation in Victoria Street was soon associating supporters together in different districts. Our hands were tied, however, until the remuneration was settled. In October the Cabinet decided to provide nine shillings per head to cover medical attendance and drugs, and we all regarded it as a fair offer.

The decision to provide the extra remuneration marked the first occasion on which I entered the Cabinet room at No. 10 Downing Street. I was called to give an opinion on the following point: If this extra money were provided, would a fairly sufficient medical service be obtained in January? I said it was doubtful, but that I thought on the whole it would if the whole power of the Government were put into it. I remember Lloyd George afterwards laughingly saying to me: "Addison, your political life is at stake." Possibly it was; but so was the ability of the Government to govern.

The first substantial break in the ranks of the opposition was manifested in December, when at the invitation of Dr. J. B. Brash, on behalf of a number of influential medical men, I attended a meeting in Birmingham. It was a crowded meeting of eager doctors; the temperature was high, physically and otherwise, but the utmost good temper prevailed. We were delighted and surprised to find a resolution of support carried. It was certain that there would be a panel in Birmingham; and the influence of this great city, not for the first time, was profound. We lost no time and spared no effort in giving the widest possible publicity to this important decision of a large body of medical men in one of our principal cities.

It would be too bad to lift the curtain too much upon what happened in January, 1913. "To enrol, or not to enrol," was the burning question on the 15th. The *Daily Mail* shouted itself hoarse in exhorting medical men to leave the unclean thing alone. Its new-found zeal for the well-being of the medical profession was whole-hearted and boisterous. But we knew by then that there would be a good body of enrolments in practically every town and district throughout the country. It was the beginning of the service that mattered; and a beginning was assured. Within a week from January 15 there was a *débâcle*. The battle was over. It became thereupon the duty of every sensible man to do what he could to secure appeasement; but we knew that it would be many years before the effects of the struggle would pass away, and before it would be possible to build without prejudice upon the foundation that had thus been provided.

These were strenuous times for all of us. We lived in a feverish turmoil of interviews, conferences and telephone calls, and Morant, Symonds and Brock were, I think, sometimes up all night. So far as my own domestic circle was concerned, I can remember more than one occasion on which my wife insisted on taking the receiver off the telephone so that we might have a peaceful evening. She kept in those days a business diary, and many are the notes of times when the Insurance Act interfered with family hours and engagements. She wrote, for instance—

"November 14, 1912.

"A welcome relief. Great hubbub in the House by Tory gentlemen. House adjourned. C.A. actually got home for dinner!"

"December 20.

"After dinner, a wretched newspaper man came in to interview C.A. on the absolutely nauseating subject of doctors."

"January 4, 1913.

"Constant talks on the telephone *re* doctors and insurance have been going on day and night for weeks. One might as well go to a lecture on the Insurance Act every night."

Now that the worst of the fight was over, we were able to devote our minds with less embarrassment to the carrying through of an important piece of work that emerged from the final report of Lord Astor's Committee on Tuberculosis.¹ This Committee had been appointed primarily to advise on a scheme for the treatment and prevention of tuberculosis. The limitation of "Sanatorium Benefit" to insured persons was plainly insufficient in the case of a communicable disease like this, although it provided the necessary

¹ The terms of reference and membership of the Committee are given in the Appendix, No. 1.

impetus and starting-point for a comprehensive system. Happily, some seven years afterwards, as Minister of Health, I was able to make the scheme applicable under public authority to all the people as the Committee recommended, but at that time the most hopeful element was that the Act provided that a penny per insured person should be available for medical research. This yielded then about £50,000 a year, and by its aid we designed and established the Medical Research Committee.

It was well we did it then, for when the war came, we found ourselves possessed of research machinery that rendered priceless service. It became possible to satisfy the most critical economists that the work of the Committee had led even to savings in money that exceeded all that had been spent upon it, apart from the incalculable value of its work in saving life and in assuaging suffering. But when our Committee started, State aid to medical research had still to justify itself. The sum available was not large, and I was glad, in framing the Ministry of Health in 1919, to have the opportunity of increasing it. But in those early days, so parsimonious had the State hitherto been, that the sum seemed magnificent, and the provision of it signified a departure from previous practice that was as novel as it was welcome. Up to that time, whilst glad enough to avail itself of the fruits of their efforts, the community had not conceived the possibility of really helping research workers, and those of us who knew from first-hand knowledge of the meagre living and desperate struggles for maintenance that some of our most talented investigators had endured, welcomed this proposal with acclamation. Under wise direction the money would go a very long way in providing apparatus and in securing a modest living for many precious workers who loved their research and who could do priceless work, but who were continually being compelled to abandon it owing to the necessity of earning money for their family's needs.

Anyone might think that it would have been an easy matter to devise a scheme for making use of such a fund, but there was a long battle between those who wanted to departmentalise the scheme by appropriating the money for the Local Government Board, and those of us who were determined to secure the utmost possible freedom for whatever body had to administer it.

Happily we succeeded in securing the establishment of the Research Committee in a strong and independent position, and the scheme of the final Report of Astor's Committee in March, 1913 (C.D. 6641) was given effect to.

In the debates on the Ministry of Health Bill in 1919 there was a re-echo of the old controversy. It was tempting, and it would

have been easy, to have brought the Research Committee wholly under the Ministry of Health, for it had justified itself beyond our highest hopes by its services during the war, thanks, largely, to Sir Walter Fletcher, its able Secretary ; but it would have been a narrow and mistaken course.

The first Chairman was Lord Moulton, and the Executive Committee appointed in August, 1913, was composed as follows—

The Right Hon. Lord Moulton of Bank, K.C.B., LL.D.,
F.R.S. (Chairman).

Christopher Addison, Esq., M.D., F.R.C.S., M.P.

Major Waldorf Astor, M.P. (Treasurer).

Professor Sir T. Clifford Allbutt, K.C.B., M.D., F.R.S.

C. J. Bond, Esq., F.R.C.S.

Professor William Bulloch, M.D., F.R.S.

Professor Matthew Hay, M.D., LL.D.

Professor F. G. Hopkins, D.Sc., F.R.S.

Colonel Sir William Leishman, C.B., F.R.S.

W. M. Fletcher, Esq., M.D., Sc.D., F.R.S. (Secretary).

We were an enthusiastic company, and our enthusiasm sometimes provoked unsparingly frank, and indeed fractious, proceedings. We had great tussles with some of the specialists. The statistician in particular is a difficult man to deal with. He lives high up in a heaven of his own and regards with scorn and pity the people who do not accept his doctrines. He may be a great mathematician and a clever fellow, but he holds the view that if a thing is good for people they ought to like it, and he has a fondness for health statistics that involve all kinds of compulsions upon the mass of the people and the most intimate inquiries into the details of their private life.

During the war some people got a notion that the mass of the population would accept in civil life the same sort of questionings as the rank and file in the Army had to submit to, whether they liked it or not. I remember, when the Ministry of Health was in the framing, I had to fight hard against a project pressed upon me by a large body of people, and supported even by Sir Auckland Geddes, that the whole population somehow or another should be called upon to submit themselves compulsorily to periodical medical examination. It is difficult to convince some learned persons that, whether good or not, there are some things that people will not have forced upon them.

But I must forbear from extending these reminiscences of the Research Committee. All too soon our cheery gatherings were put an end to. A quorum was got together when necessary.

gave himself a headache. It was because of this that, many a time, when an interview had been arranged, he would greet you with an irritable, if good-natured, explosion. It used to offend people who had not the patience or discernment to pass it over with a friendly laugh or to give him a Roland for his Oliver. But nobody was more alert than he was to detect a weakness or to offer a useful suggestion. He never sought to be a master of elusive methods, although he would often give people the impression that he was being elusive. For the most part, it was his way of letting them know that they were not clear themselves, and that he saw it. But these things were only the outer show, and, so far as my acquaintance has gone, there are few finer brains in Liberalism, and it is a reflection on our electoral institutions that he should have been out in the wilderness so long.

Someone once said to me: "It only needs for a part of my life to be past for me to imagine that it was happy, just, I think, because it is past." And we all know how, as children, the page of a lesson learnt seemed unaccountably easier than the one being learnt. So with the events recorded in this chapter. Some of us felt that we could never again be called upon to live through such strenuous and anxious days and nights as we did when fighting the Insurance Act. We did not dream that, little more than a year after the successful achievement of that Act, events a thousand times more anxious and strenuous would be unfolding themselves before us.

CHAPTER II

THE COMING OF WAR AND ITS EARLY DAYS

SECTION 1

THE COMING OF WAR

Election Possibilities in 1914—The Home Rule Struggle—Feeling in the Liberal Party—The Palace Conference—Asquith—Carson—The Austro-Serbian Affair—Feeling amongst Members—The Coming of War.

SECTION 2

EARLY DAYS OF THE WAR—DOMESTIC INCIDENTS

Ministerial Resignations—The Board of Education—Recruiting Blunders—Kitchener—The Men in the Camps—War Babies and other Tales—Hospitals for the War Office—Municipal Authorities—The Drink Question.

SECTION 3

A GREAT DEFICIENCY REVEALED

War Revelation of Weaknesses—Instruction to prepare Proposals—Montagu, Haldane, Lloyd George—Pay of Scientists—Pease's Lunch—The Educational Proposals—Origin of the Committee of Scientific and Industrial Research.

SECTION 1

THE COMING OF WAR

IRELAND and the Budget were twin dangers during the summer of 1914, as they had been more than once before.

At that time some of us were in charge of arrangements for propaganda in view of a possible election, for no one knew what would result from the resistance to the final passage of the Home Rule Bill under the provisions of the Parliament Act.

Attached to both the old-established political parties there is an army of open-air speakers and other so-called "workers." Machine politicians always attach importance to them, but I never knew anyone else that did. Perhaps it was because of my scepticism of their value that it fell to my lot at that time to supervise the work of a group of them in London. Budget questions were their chief topic, and notes that had long lain unused must have been called forth to provide material, for in overlooking reports of what they

had been talking about, it appeared that small-holdings, the growth of cabbages and potatoes, and Wat Tyler's Rebellion, figured prominently in their harangues. They were quite pained when I pointed out to them in the frankest possible terms that the electors of industrial London were not likely to become enthusiastic supporters of any political party that had nothing more serviceable to offer. There are plenty of their kind still talking, even on more exalted platforms, and the Labour Party may well pray that they have long life and a continued flow of words.

There was much trouble over the Revenue Bill in 1914, especially over the famous Form IV, and I am tempted in connection therewith to quote an extract from my diary of July 3—

"Breakfasted with Lloyd George. An American lady was there who entertained us with her Americanisms. Her descriptions of an American camp, of the rioters in California, and of the interior of the mills of the Harvester Twine Company, were lurid and amusing. If her descriptions were anything like correct, there are no conditions of female labour in this country to touch them on such a scale. For all that, we heaved a sigh of relief when she went, and L.G. had perforce to rest on the sofa. We discussed the Form IV and the Revenue Bill. I suggested that if he wanted to lose the General Election, if it came before next year, he would be well advised to send out a million of the enquiry forms. If, however, he wished to win it, it would be well to refrain. He agreed heartily and said we must find another way round. We discussed Montagu's plan of working on the existing basis of valuation. One thing is certain, there must be a simpler Revenue Bill and no Form IV."

Breakfasts with Lloyd George will often be mentioned in these pages, so that perhaps a brief description of one of those pleasant events may be of interest. The hour was 9.15, and, sometimes when I had caught an early train to town, we would stroll for a few minutes round that walled-in enclosure, called "a garden," that appertains to No. 10 and No. 11 Downing Street. Lloyd George would have spent an hour and a half or more at papers before then—the daily papers and office papers. If he had read the prepared memoranda on the subject we were met to discuss, I was happy; if he had not, they stood a bad chance. The breakfast-room at No. 11 is much pleasanter than the great place upstairs at No. 10, where the table seems to be lost in surrounding space. Mrs. Lloyd George had the breakfast-table at the end of the room at No. 11, where it looked out over the garden and the Park. It was as homely and simple an occasion as could be. You helped yourself from what was prepared on the side-table, and the company was very often limited to the Chancellor, his wife, and Megan—a little girl in those days, and as vivacious as her father. Current political gossip, the line being taken by the different papers, parliamentary

incidents, and so forth, provided nine-tenths of the conversation. There was no avoidance of "shop": it was life to Lloyd George. He and I often finished with an apple, and, leaning across the table, or back in his chair, Lloyd George would say: "Well, Addison, what of so and so?" and the sitting had begun. Mrs. Lloyd George would leave us as we were, and Megan too, often after extracting from her father some pledge of participation in her day's doings. If we were not interrupted at this stage by the entry of one of his ministerial colleagues—as we often were—the work that we had to do would be done quickly, for Lloyd George can get at the heart of a case as rapidly as anyone if he has read up a prepared statement of it beforehand; otherwise, he is apt to seize on to some side-issue and make it the case itself. No one is quicker in divining a strong point or a weak point, for he is above all things a politician, with his eye on the "man in the street." He is a good talker and a good listener, but you have to know him well before you are sure that he is really listening, for his mind, when he seems to be listening, may often be occupied on some collateral or altogether different issue, as you will find from the sudden interjection of a new question. When he has made up his mind, no one can be prompter, but I have often known him fence with a subject for weeks, although on many occasions during that time he may have asked you to come and talk about it. In those days he was a left-wing Radical, as I was, and grasped at any practical proposal likely to be useful to humble folk. I used to think that his mind was at its very best after breakfast, when we went for a quarter of an hour's walk round the Park, to separate afterwards on some agreed understanding at the Foreign Office steps.

For several years I think I shared his projects as closely as any man, though I very often knew that I had not divined the intention—if there was a formed one at all—that was behind his eyes.

It was not many days after the breakfast of July 3 that the struggle over the passage of the Home Rule Bill developed and the fate of the Budget, even, became a matter of minor interest, until both were utterly blotted out by the war-cloud that descended upon us.

The Home Rule issue inflamed the rank and file Members of the Liberal Party, and they were almost as angry at the handling of it by their own leaders as they were at the violent conduct of its opponents. The facts were bad enough, apart from the excited gossip that was spread by day and night in the lobbies. There are no places where those who run hither and thither bearing or inventing tales have such chances as in the lobby and smoke-rooms of the House of Commons. Every Parliament has its sprinkling of

these whisperers. We know them well. They come pulling your coat and saying, *sotto voce*, "Have you heard, old fellow, what happened this morning?" and a lurid tale is unfolded that invariably concludes with this assurance: "I got it on the best authority." Tittle-tattle without end—and in infinite variety. There was a harvest ready-made for them on Ireland just then. Every Minister in turn was weak-kneed and a wobbler; the next day they were out to fight, to "stand up to the Tories," or, if need be, to seek a feud with the Monarchy itself; the Tories were going to force a dissolution; they would run away at the last; all that was necessary was that Asquith should keep a stiff back, and so on. When grave things are happening, your village inn or the common washhouse is not in it with this handful of neurotics who are a nuisance in every Parliament until their value has been assessed and they become harmless, because they have become a jest. Knowing fairly well what was going on in Ulster, we regarded Lord Robert Cecil's motion of censure, on June 16, for the non-suppression of the Irish Volunteers, as a Gilbertian performance, but it was worth making in that it evoked what many of us thought the best speech Dillon ever made in the House of Commons.

In my time, no issue roused such acute political passions as did Irish affairs during July, 1914. In all the excitement of the Parliament Act controversy in 1910 and afterwards there was never such a degree of bitterness and real anger. It reached its climax, so far as the rank and file were concerned, during the week beginning July 20. On that day Mr. Asquith's statement on the Irish Amending Bill and the announcement of the conference at Buckingham Palace were received with puzzled silence, and with a profound distrust on our side. Whatever Cabinet Ministers might be disposed to do, there was no doubt that the bulk of the Liberal Party were vehement in their intention to support Redmond and the Irish Members. A largely attended meeting of Liberal Members was held at four o'clock on Tuesday, July 21, under the chairmanship of Sir Thomas Whittaker. The vital part of the resolution presented to the Prime Minister was to urge him to refuse absolutely to consent to a dissolution until, not only the Home Rule Bill, but the Plural Voting Bill, had been carried through under the provisions of the Parliament Act. There was no expectation on the part of any of us that the conference at the Palace would succeed, because the more head-strong and, apparently, dominant spirits of the Conservative Party looked for a failure of the conference in the hope that its failure would be followed by a dissolution. Rumour was so excited and so circumstantial that even Royalty was credited with all sorts of dispositions and intentions so obviously unconstitutional as to

disprove themselves, but in the excitement that prevailed the Liberal and Labour Members of Parliament were convinced almost to a man that, in the event of the failure of the conference, a dismissal of Ministers and a forced dissolution were in contemplation ; and many responsible Members became persuaded that they might have to fight a Royal Veto as well as a House of Lords Veto.

Whoever was responsible for circulating the misleading but circumstantial reports that gave rise to these impressions rendered the greatest disservice to the Monarchy, but it is impossible to express at this time the bitterness of the feeling that was entertained. From Wednesday, July 22, it became apparent that the conference would break down, and Members received the announcement of its failure on the Friday with a real relief. The gun-running episode of the week-end, Saturday the 25th to Monday the 27th, only made matters worse. An election precipitated at that time would have been regarded as a challenge to our parliamentary institutions and would have let loose forces and passions which might well have altered the course of our national history.

The feeling in the Liberal Party, and, I believe, in the Labour Party, was directed almost as much against the Prime Minister as against Lord Carson and the organisers of the Ulster movement ; and Cecil's motion of June 16 was pointed at the weak place in the Government's case. Few of us could understand, and it is impossible to understand now, how the Government could look on at the organised and open preparations for civil war without making any attempt to put them down. Either the law was to be administered, or it was not. If it was not, the whole proceedings of Parliament were being brought into contempt by forcing the unaltered Bill on to the statute book. It was no use simply crying out against the Ulstermen. They meant business ; and whilst, no doubt, there was a good deal of bluff, it was evident that, whether we liked it or not, the men who were leading them were just as keen and determined in their opposition as the Nationalists and those of us who supported the Home Rule movement. If concessions with regard to Ulster had to be made—as they clearly had—why had things been allowed to drift so far ? This was the question men were asking, and it was directed more against Asquith than against anyone. Most of us certainly were convinced that if the situation had been more firmly handled before it had become thus desperate, we should have been spared many distresses. It needed the frankness as to principle and the willingness to secure the rights of minorities which Campbell-Bannerman displayed in handling the grant of self-government in South Africa.

There may, perhaps, have been some ground for believing that

the Conservative Party might uphold an outbreak in Ulster and even stand as the champions of law-breaking, for had we not had experience of the power of some of their Members, whose incredible folly had encouraged the House of Lords, only four years previously, to attack the growing power of the people? It was believable, but it was wildly improbable. There was not much doubt as to the calculation Carson was making through all this. Years afterwards, during the war, he and I worked together very closely and became firm friends, and the downrightness of his character reveals what it was. He was not concerning himself with the Tory Party, he knew well enough that the demand for self-government for Nationalist Ireland was not to be resisted; all that he was prepared to fight for was that Ulster should not be forced to become identified with the rest of Ireland in the form of government proposed. Determined, unrelenting, even fanatical in this, he was prepared to run the risk of a smash if necessary in order to secure what he considered to be Ulster's rights. A friend who knew his mind (and I think his judgment was right) told me that Carson, having observed Asquith carefully for many years in the House of Commons, went on with his preparations openly, having deliberately come to the conclusion that he could afford to risk it, and that Asquith would not step in and stop him.

Altogether the management of Irish business on that occasion, as on so many more, revealed British statesmanship at its very worst, and not Liberal statesmanship alone. The weak side of Asquith was prominent at that time just as the handling of the great war issue that was to arise a few days later showed his splendid strength. Rather than face the issue, as Campbell-Bannerman would have done, he appeared to drift along in the hope that something would turn up. But when a vaster question arose he was a tower of strength and sanity, and the steadiness of our people in the early days of the war and their complete solidarity were due more to him than to any other man; and this service of his will rightly be remembered long after his failings and most of his critics are forgotten.

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This, then, was the state of political turmoil when, as if a thick curtain had fallen upon it, the Irish Debate of Monday, July 27, suddenly seemed to relate to something afar off. The Austrian-Serbian affair, with all its horrible potentialities, made a quarrel over Ireland wicked and impossible. Nobody took any interest in the proceedings of the House. I remember that Mr. Francis Acland, then at the Foreign Office, told me during the evening that it looked as if Germany were deliberately risking a big war. So much,

however, will Britishers persist in going on with current business that, on Thursday, July 30, there was a meeting of the Committee on the Ventilation of the House of Commons! We had as much interest in the subject as if it had been a dead rabbit. A largely attended meeting of Liberal Members, called by Mr. Ponsonby I think, was held the same afternoon at four o'clock, and a further meeting at six o'clock. Lord Grey sent us messages asking us to give no public expression of opinion as to this country being neutral, informing us that, although he had told the French that we must consider ourselves bound to act in accordance with our Treaty obligations and interests, they must not consider that we were bound to support them. It was suggested that any statement, even from a group of Members, that this country would not come in, might have the effect of hastening the German attack on France. On Friday there came the news of the German proposals with respect to Belgium. There were two meetings of Members again that day, the second one being largely attended. One motion only was put to a division. It was to the effect that this country should remain neutral whatever happened as to Belgium. Most of the Members did not vote at all, as they felt so much in the dark. Nineteen appear to have voted for the motion and four against it, of whom I was one, but the vote of the nineteen represented little more than a pious opinion, as many of them confessed. Everybody was in abject misery. The City was already in a panic and people were laying in stores and hoarding up gold. I found that my own total possession of gold that day was £7. I thought that this would carry us far enough over the week-end, and my wife and I, over the telephone, agreed to be content with that.

The House met again on Saturday, August 1. French and German mobilisations were a fact. The Germans clearly intended to go through Belgium and we should be involved. We were all glad that Monday was a Bank Holiday, as a moratorium was inevitable. At the time of Grey's statement in the House on Monday, August 3, chairs were placed on the floor for the first time within my knowledge. I remember that I sat with a Die-hard Conservative Member on one side, and a Labour Member on the other. We may have glared across at one another a week before, but parties were snuffed out now. Grey's statement convinced the whole House, with perhaps two or three exceptions, that our pledges compelled us to participate, apart from the obvious fact that, with the Germans on the Channel coast in a few days or weeks, we should soon be compelled to do so in self-defence. Redmond's speech that day was a stroke of political genius. It put out Ulsterism and the Anti-Home Rule movement like the extinguishing

of a candle. There were two meetings of the Foreign Affairs Members' Group that day (Monday), and at one of them Mr. Ramsay MacDonald and Mr. Henderson joined us in the consideration of measures which might be necessary to relieve distress at home. On the Monday also we had our first experience of lightning legislation. The Moratorium Bill became an Act in a few hours and was the first of a long series, some of which represented experiments in State Socialism that would have horrified three-quarters of the House ten days before. The panic in prices continued, and it was only a question of time before State regulation would become necessary. What haunted me, I remember, at the time, was the thought of what my constituents in Hoxton and others in similar poor and overcrowded districts would do. Happily the realisation proved to be much less distressing than the anticipation.

On Tuesday, the 4th, came the Prime Minister's statement, and his denunciation of the "infamous proposals" of the Germans in Paper 85, concluding with the formal announcement of our ultimatum. The motions in Ways and Means which usually take many days were passed in a few minutes, and I noticed with a moment's interest and relief that the Education (Provision of Meals) Bill was amongst the number of measures that went charging through. All sorts of rumours of Cabinet resignations were circulated, but they interested none of us at all. Outside the walls were placarded with proclamations calling out the Reserves and embodying the Territorials.

Twelve o'clock! The war had begun. Who could tell how it would end?

SECTION 2

EARLY DAYS OF THE WAR—DOMESTIC INCIDENTS

With the beginning of war my pleasant work as a private member and as a handy man to friends on the ministerial bench came suddenly to an end.

Before the announcement of the German intention to go through Belgium at least five Ministers had decided to resign, but this communication stiffened their backs. In commenting to me upon the effect which would have followed if a group of them had resigned, Sir John Simon used a phrase worth recalling in view of subsequent history. He said that considerable resignations would mean the immediate formation of a coalition, and his opinion was that "the formation of a coalition would mean the grave of Liberalism." Lord Morley resigned, as we were told, not because he disapproved of the action taken by the Government, but because he felt physically

unable to bear his share of the heavy responsibility which the conduct of the war would entail. The only other resignation of a Cabinet Minister was that of Mr. John Burns. I do not know that he ever stated the reasons for his action, but it would be hypocrisy to pretend that many Liberals lamented over it ; it marked the end of a long term of office, most of which had been spent at the Local Government Board, and was noteworthy only for a self-satisfied waste of precious opportunities. I remember that in our conversation both Simon and I were pessimistic as to the future of those projects of social improvement that had been announced in the Budget. It looked as if all the things that we had laboriously been building up would come toppling down, although there was already a crumb of comfort in the passage of the Children's Act and in the fact that some provision was being made for improved housing. But, as already seen, these dismal prognostications were not sustained by subsequent events.

The resignation, however, that affected myself, was that of Mr. Trevelyan, then Parliamentary Secretary to the Board of Education. Some weeks before there had been talk of appointing me to an office. I was told that in the course of contemplated changes there would be a vacancy at the Local Government Board to which I was to be appointed under Sir Herbert Samuel, that the Insurance work was to be moved there and put under my charge as Samuel's lieutenant, leaving Masterman free for Parliamentary Bill work as Chancellor of the Duchy as soon as he could find a seat. On Friday, the 7th, Gulland told me that I might expect a summons on the morrow and I must not be far away. A telephone message accordingly came on the Saturday requiring my attendance at No. 12 Downing Street, at 3.15, to see Mr. Illingworth, the Chief Whip. Turning into Downing Street, I collided with Sir Harry Verney on a similar errand. He was better informed than I was, for he knew that I was to be appointed to the Board of Education and that he himself was to go to the Board of Agriculture. Gulland received us and rejoiced over us. Illingworth announced the fact of our appointments to us, for Asquith had no time to attend to minor matters in those days. There had been the usual log-rolling and wire-pulling in the interests of one or two with "family influence," of which I was happily bereft, but I found that I had had active supporters in Lloyd George and Haldane, as well as in Montagu and Illingworth. It came about, therefore, that, on Saturday, August 8, I found myself installed as Parliamentary Secretary to the Board of Education, with the best of chiefs—Mr. Joseph Pease, now Lord Gainford—and with many domestic war duties already allotted to the office.

The Parliamentary Secretary at the Board of Education has a charming room looking over Charles Street, and I found there Mr. J. A. Barlow, who had been allotted to me as a private secretary. Sir Amherst Selby-Bigge had chosen him, and he knows how to choose men. Afterwards I took Barlow from the educational things he loved to munition-making, where he stayed with me as private secretary, until Montagu, as Minister, enlisted him for himself.

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It may be interesting, before coming to the great events of the war itself, to say something of the odds and ends of work it brought to those of us employed in a Home Department that was as much removed as any could be from the conduct of war business. They are illustrative of the universal spread of the war's effects.

The first solicitude of those who had the care of domestic concerns was the condition of those who must, at all events for a time, be suspended from their ordinary work. It was important to arrest any tendency to panic, and it was unthinkable that multitudes of people summarily suspended from work through the onset of war should suddenly be compelled to seek assistance from the Poor Law. No one quite knew what the effects of the moratorium would be until the new paper-money could get into general circulation, and the whole business and industry of the nation was in a state of paralysis and uncertainty pending its readjustment to the unforeseen activities of war. I believe Mr. Winston Churchill coined the phrase "Business as usual," and, although there obviously was a narrow limit to work "as usual," the phrase rendered a real public service, for it was taken up vigorously by the Press and had a steadying effect. Emergency Distress Committees were organised under Samuel's direction at the Local Government Board, and the work was done with remarkable promptitude and smoothness. My section of the task was to have charge of them in the Metropolitan area, but distress was never so great as had been anticipated. In the Borough of Shoreditch, for example, the maximum figure of the unemployed was less than 3,000, and on October 24 the numbers had fallen to 808. During 1922 and for a great part of 1921 the number of those registered as unemployed in the same district was anywhere from 7,000 to 10,000, so that the distresses of those early war days were much less than in this later dismal period of so-called peace. It is true that the machinery for registration was less complete then than it is now, and a great many endured privation without seeking assistance, but the comparison is, on the whole, a fair one.

Everybody remembers the long queues of volunteers who lined

up before the recruiting offices in those days and waited for hours in the rain. We wondered why the War Office didn't arrange to send somebody down the line to take their names and addresses and arrange for them to be called up later when they were able to deal with them. The proceeding was characteristic of early War Office methods, and the explanation is simple enough. Many of the men in charge of the first recruiting offices had been called up after years of retirement; they clung to old-established methods, and they had it in their bones that there should be "no civilian interference." They obstinately continued to deal in this way with a problem of unprecedented size until early in November, when it was agreed to register names and call for the men when the arrangements for their training and equipment were sufficiently advanced. The woeful lack of imagination and sympathy in dealing with an overwhelming national desire for service and sacrifice, especially in Ireland, did much to disappoint men and to damage voluntary recruitment, notwithstanding the superb patience and patriotism displayed. Subsequent history in Ireland certainly showed that, had the question been dealt with there as Redmond and other Nationalists pleaded for time after time, we should have been spared many later troubles, and vast numbers of men who became the recruits of Sinn Féin would have been loyally fighting our common battles.

When the country had recovered from the feeling of unreality engendered by the declaration of war, all eyes were instinctively turned towards Lord Kitchener, "the strong, silent man," No man in the empire probably possessed the confidence of the "man in the street" quite in the same way as he did. Public opinion clearly said that he was the man to organise the country for war. As is well known, the Government hesitated for a time. He was allowed to get as far as Dover on his way to Egypt before he was recalled to join the Cabinet as Secretary of State for War. There could be no doubt as to the popularity of his appointment; but Kitchener suffered, as other people and other causes have suffered, through exaggerated advertisement. People were led to expect the impossible, and, although nothing can ever blind us to the immense services he rendered, there is no doubt that his work amongst coloured and more or less subject races had deprived him of a clear understanding of the mentality of the patriotic British working man. The volunteer did not resent standing for hours in the rain and losing a day's pay in order to try and get enlisted, if he were satisfied that this was the only way of dealing with his application. He did not mind tramping about in the mud and cold in the improvised camps

whilst he knew that everybody was doing their level best to get the camp together ; but he did not see why he should have to tramp about the lanes in the cold, or shelter under a friendly haystack, when he had got into camp, and he denied any recreation or amusement in an evening when there were many willing and able to provide it.

There was in those days a good deal of bungling and obstinacy on the part of the War Office in these matters—and splendidly they amended them afterwards—and it is no disparagement of Kitchener's great achievements to recognise that a substantial share of the responsibility for this early mishandling of the patriotic fervour attaches to him. Lloyd George told me one day, in discussing Kitchener, that someone had wittily said to him : " Lord Kitchener might or might not be a great General, but he was certainly a great Poster," which was a very true remark. He provided an invaluable rallying force for the national enthusiasm. He was, I believe, the first man to visualise the magnitude of the task before us. He talked of a three years' war when others were speaking of a year or less, and his call for a million men was the first dramatic embodiment of his foresight.

By the end of October, it was evident that the condition of some of the standing camps where the men had nowhere to go and nothing to do in their spare time was having a bad effect upon recruiting. To keep the men at military duties from dawn until bedtime was calculated to make them stale and to take the edge off their keenness, apart from the fact that it was physically bad. The long nights were drawing on, and it was clear that for several months to come, except for occasional outpost duties and other night exercises, they would be at a " loose end " for a considerable number of hours. A Committee, therefore, was appointed, under Pease's chairmanship, to help to organise recreation and instruction in the standing camps. We had our first meeting on Thursday, October 22, and it was, on the whole, one of the most extraordinary committee meetings I have ever attended. Apart from the fact that Lord Middleton and the Duke of Norfolk were not able to be present, the whole Committee assembled, except the representatives of the War Office. The Admiralty men welcomed our co-operation in their camps at the Crystal Palace and in Dorset, and we had a practical discussion as to ways and means. Still no War Office representative arrived. After about twenty minutes a message was sent from the War Office to say that they were coming. Finally, instead of representatives, a messenger came bringing a letter from Kitchener. In frank terms it let us know that he did not want the Committee. Civilian assistance, he said, was not required, and he

would build some huts and give the men military lectures in an evening ; they would be kept at work all day, and ought then to go to bed. It displayed a woeful lack of imagination. Methods of this kind would certainly not do for the British Tommy, who, though as keen as mustard to be made a good soldier and to endure anything in the making, had the love of liberty and of a bit of fun in his marrow. Accordingly we adjourned, and it was agreed that Pease should take the matter up with Asquith and Kitchener. I believe, indeed, that the War Office representatives had started for the committee but were haled back again. According to Pease, there was a somewhat stormy interview the following day between Asquith, himself, and Kitchener on the subject. Kitchener would have none of it ; but Asquith handled him wisely and gave him a day or two to cool down. Later in the day we found that the cooling process had made progress, for Kitchener decided that a War Office Committee should be set up to deal with the matter, and that the Board of Education should help to secure the co-operation of the local educational authorities and others, and that, further, our suggestion of having local camp committees with laymen upon them should be adopted. A little patience was evidently required, so we went ahead with our preparations. On Tuesday, November 3, the Chairman of the East Riding District, with characteristic Yorkshire vigour, said that they intended to go ahead with their camp lectures and entertainment arrangements, and that if they met with obstruction we should hear about it. Mr. Goldstone, M.P., let the cat out of the bag in an article in *The Times* Supplement which evoked a friendly leader, the Lobby of the House of Commons began to be interested in the subject, and on Thursday, the 12th, Mr. Hogge, M.P., raised it in one of his characteristic speeches.

There was a widespread demand for camp lectures and entertainments, and a whole series of arrangements for providing them soon developed, not only in the standing camps at home, but with the armies abroad. No praise can be too high for the department of the War Office that had charge of these arrangements and welcomed outside assistance with open arms. On Tuesday, November 24, Kitchener withdrew his objections to the proposed system of grants-in-aid of what the local authorities and others did, and friendly working arrangements were established between the War Office, ourselves (as the supervising authority), the Local Education Authorities, the Y.M.C.A., and the other agencies employed.

During the winter of 1914-15 a great outcry arose about "war babies," and if we had believed the lurid tales of some people

in those days we should soon have found the nation supporting multitudes of illegitimate children. I remember receiving a small deputation, headed by a well-known lady, who came to see me at the Board of Education on this subject. The lady said, in effect: "You are supposed to be interested in maternity and child-welfare. Here are all these tens of thousands of girls going to have babies. What are you going to do about it?" After she had unburdened her mind, I suggested that it would be somewhat premature to establish expensive arrangements in advance unless we were sure of the facts. This was met with an indignant remonstrance, and I was told that in town after town, in factory after factory where women were employed, terrible consequences would ensue in due time. Finally, I suggested that it might perhaps be well to give me the name of one place in which we might be able, by some discreet inquiries, to establish the truth of her contentions; and with great confidence a certain factory in the West of England was named as an example. It was agreed that the deputation should be adjourned until we had had some opportunity of confirming these reports so far as we could. By the aid of one of our most tactful lady inspectors, and with the goodwill of the heads of the firm in question and of the forewomen, who were privately told of the character of the reports which it was sought to confirm or disprove, we were able, in an unobtrusive way, to get a fairly complete enquiry made in that factory where a large number of young women, mostly unmarried, were employed. The long and short of it was that, so far as it could be ascertained, there were only two women in the whole factory at that time expecting to be confined, and both of them were married women. I met the chiefs of the deputation afterwards and they departed without any signs of relief at the glad news.

Another fairy-tale we had to deal with related to the employment of school-children on farms. According to the excited accounts that gradually gained credence, the Board of Education was consenting wholesale to their employment. The late Sir William Byles, of Salford, made a violent attack upon us on this account on February 25, 1915. The fact was that, out of the three million boys attending elementary schools in the whole country, only thirteen hundred had been allowed out to work on farms, whilst in the district of Salford there were no less than 2,300 school-children working out of school hours, many of them doing from twenty to forty hours per week. The cotton trade had seen a mote in the farmer's eye, forgetful of the beam in its own. One day I received a deputation of six elderly and well-meaning spinsters who were convinced that the solution of our food difficulties was to be found in teaching

school-children jam-making, pickling, potato-growing, and the rest. We had only to say the word and teachers of these arts would spring into existence with thronging classes. I recommended them to have a talk with Sir William Byles, but gave them a little comfort by telling them that we were already paying grants on 57,000 courses of instruction in gardening, and that, so far as we were concerned, the door was wide open for many more.

One duty allotted to me at that time brought me into extensive personal relation for the first time with those authorities with whom I was afterwards so closely associated at the Ministry of Health. On January 25, Pease instructed me to approach educational and municipal authorities in order to arrange that the War Office should have at their disposal 15,000 additional hospital beds at the end of March, and 25,000 by the end of June. For this purpose he appointed me Chairman of a group of three, consisting of Mr. Dale and Mr. Fletcher, of the Board of Education, and of Major Lelean, from the War Office. It was a heart-breaking business for those who loved education to have to arrange that a first-rate elementary school, a technical school or a museum should be emptied and made use of for hospital beds, but this had to be done. The London County Council gave us a good start with 4,400 beds, and Reading followed suit with 1,300. In twenty-four days we had arranged for the first 15,000, and the rest was easy.

There is a type of citizen common as Mayor, stolid, somewhat stodgy and unromantic, but very reliable for getting the work done efficiently and without fuss. But competency of personnel both of the membership of municipal bodies and of the executive officers is very patchy. Leicester, say, in the morning, was all efficiency, but in the afternoon in Nottingham you came to the conclusion that the well-being of the citizens, as represented by those appointed to deal with us, might properly be the subject of prayer. Bradford settled the matter so quickly that for a few hours we were in need of occupation, in consequence of which Dale became so dull that we sought refuge in the evening in "Potash and Perlmutter." We had been told that in Alderman Kinder, of Leeds, we should find an efficient and dominating personality, and we did; a slice of him might well have been spared for one or two Western cities whose traditional dignity is characterised by repose. Birmingham was on its high-horse as usual, and fully conscious of past glories, but it would oblige you all the same. Liverpool, Manchester, and Sheffield needed no prompting, and gave what was asked in a few days. There are some towns in which municipal life has attracted the best type of citizen and where there is a competent and cheerful staff; but there are others which have got into the hands of

mediocrities and are always in trouble. The reason is that in such cases, except when they are stirred up occasionally by some special cry such as "Anti-waste" or "It's your money they want," 75 per cent. of the people take no interest in municipal government, and they get what they deserve.

One afternoon, when we had returned to town in rather a wearied frame of mind from one of these hospital excursions, marked the occasion of my meeting Mrs. Asquith for the first time. I was going down to dine at the House when an urgent message came from Sir M. Bonham Carter that he wanted me to join him and two or three friends at dinner in the Carlton Grill Room, and he assured me that a somewhat ancient blue serge suit would do very well. On arrival I found that his friends consisted of Mrs. and Miss Asquith (now Lady Bonham Carter) and an officer from the Admiralty. I am quite sure that Mrs. Asquith was woefully disappointed in me, and must have put me down as a very dull fellow. Perhaps it is an upbringing in the flat Lincolnshire marshes and generations of tenant-farmer blood that makes one unresponsive to certain types of elegant conversation, but I came away convinced that Mrs. Asquith had been dreadfully bored, and, to tell the truth, so had I.

During the spring of 1915 this country missed a great opportunity of dealing comprehensively with the drink question. The licensing trade was disposed to accept reasonable terms for national purchase, and public opinion on the whole was favourable. A Cabinet Committee had been at work on the subject and in touch with the representatives of the Trade for a considerable time, but all that came of it was the establishment of the Liquor Control Board under Lord D'Abernon. The Control Board accomplished a great work, but what have we to show for it to-day? We might have had a system whereby the conduct of the Trade would have effectually come under national control, and that with the consent of the Trade itself. The apostles of prohibition, of improved management, or of any other specific, would then have had free opportunity for advocacy and experiment. Judging by the experience gained in munition areas where licensing premises were acquired, it is certain that the terms which the Trade was disposed to accept would have provided a most remunerative investment. Progressive reform would, for the first time, have become possible.

Plenty of lifelong temperance reformers like Sir Thomas Whitaker were whole-heartedly in favour of the scheme of national purchase. The people who killed it were other "temperance" reformers. They bullied and threatened successfully. Asquith ought never to have allowed himself to be overborne by them. As

to their argument that it was wrong for the State to have any interest in the Trade, how can that be maintained when millions are drawn from the Trade in taxation and used for national purposes, and the taxes themselves are framed in such a way that the more that is drunk the bigger the revenue? The frame of mind, too, that advocates temperance, and at the same time obstinately resists any improvement in the public-houses themselves in our industrial districts, is, and always has been, utterly incomprehensible to me. The mischief, the poverty and the degradation that these places bring is altogether undeniable. Then why in the name of common sense should we prevent people from altering and improving their premises so that those who go into them may have an inducement to do something other than drink? Is the British working man, who has no decent home to go to, likely to drink more if he has a comfortable chair to sit on and some entertainment to listen to, than if he were penned up in a wretched enclosure with nothing to do but to stand before a bar and swill beer? But all this pleading was as nothing. The "temperance" reformers who ruined this precious opportunity preferred that these disgusting conditions should be left alone: nay, be allowed to become worse, in the righteous and Christian hope that they would become so intolerable that prohibition would be inevitable. Evil was to grow worse so that good might come of it; we were to gather grapes from thorns; and the working men in our industrial districts were to continue to be deprived of decent places to go to in an evening.

Publicly it was understood that the scheme was rejected because of Treasury and bankers' objections; but these could, and would have been, overcome, and a practicable financial arrangement arrived at, had it not been that Asquith was overborne by this group of zealous men who, calling themselves temperance reformers, have contributed practically nothing to abate the shocking evils of excessive drinking.

SECTION 3

A GREAT DEFICIENCY REVEALED

The war had not been going on long before the revelations of the physical unfitness of many recruits began to make a painful impression, and the Chancellor of the Exchequer agreed that it would be an unwise economy to abandon the health measures which had been promised in his Budget statement. At the same time, the growing demand of the war for people with technical or scientific training, coupled with the very inadequate supply, led to a return

to some proposals I had prepared for Lloyd George before the Budget for increasing the facilities for technical and higher education. They had been put aside, but on December 2 Pease instructed me to get together an office committee to frame suitable proposals. He approved the first rough draft of them on December 22, and a paper for the Treasury was got into shape early in January. Lloyd George knew what was coming, and insisted, as usual, before receiving anything in writing, on having a general talk on the subject. This took place on January 19, 1915, when Lloyd George, Lord Reading, Montagu and I had lunch together. After lunch I was called upon to describe the war revelations of our national shortages in technical and university education and the consequent dearth of trained workers. Lloyd George said: "It is no good your asking for money." My reply was that, if that was the case, we might as well drop it. He had only to recall that he himself, Reading, Montagu, Mr. McKenna and others who were in daily touch with war difficulties, had already experienced the enormous handicap of our neglect of scientific training. We were pressed every day at the Board of Education to find people who could help us with dye questions, glass-making, drugs, explosives, and many more, and all we could do was to fall back on the small band of splendid men who were already grossly overworked. Moreover, if we were going to master competition after the war, we must be better equipped in these things; and trained men could not be produced rapidly. Further, nobody knew how long the war would last or the extent of the demands that it would make upon us. Montagu and Reading were sympathetic listeners, as, indeed, was Lloyd George. Finally, he said: "Well, go ahead. How far has your Committee got in framing proposals?" This was the question that had been waited for, and the answer was available.

After this conversation an office document was prepared giving an outline of what was proposed but governed too much by the consideration of what might be obtained from the Treasury rather than by what was really necessary.

The sequel was gratifying.

On Friday, the 29th, Haldane sent for me and greeted me with this: "Addison, this document has compromise written all over it. Just tell me frankly what you would like to do if you had a free hand?" The substance of my reply, as noted down in my diary that day, is as follows—

"If I had a free hand, I should look round and lay hold of the ablest men I could find, select a few special institutions, and devote them to the application of science to industry, specialising in one place, in pure research; in another, in research in its application to

coal-tar by-products; in another, textiles; in another, glass; in another, drugs, and so on—in fact, try and work out a national scheme whereby in the course of time we could develop an organisation that would turn some of the best brains in the country on to establishing a real working alliance between science and industry. At the same time, we should have to increase the provisions for training teachers, for giving higher instruction and for producing a sufficient supply of competent workers—and pay them properly when we had done so. We ought to start with the material we had as soon as possible, and the way of doing it should be worked out without delay."

To my surprise and delight, he heartily concurred, and said that Lloyd George and he, with Pease's full consent, wished me to undertake the chairmanship of a small committee to work out a scheme whereby national assistance could be given to scientific and industrial research. He made two suggestions as to the working committee: (1) that Heath (now Sir Frank Heath, Chairman of the National Council on Scientific and Industrial Research) should be a member; and (2) that whoever else was called in to help, we should avoid axe-grinders like poison.

This interview of Friday, January 29, marks the beginning of the National Council on Scientific and Industrial Research.

It so happened that on the following Monday Heath reported a forcible illustration of how it would pay us to encourage research work in industrial problems, but I have learnt the full details of the case only since preparing the materials for this chapter. It should be placed on record, for its sequel provides a striking instance of the shocking way in which this country has been accustomed to treat men of science.

Picric acid is a constituent of the explosive lyddite, and was required in great quantities. The chief source of this substance is phenol, or carbolic acid. In the autumn of 1914 enterprising monopolists had rushed the price of picric acid up to five shillings per pound, and it was being bought by the War Office at that figure. Lord Moulton invoked the help of Professor A. G. Green, of Leeds University, in working out a cheaper process. At first the plant, recommended by Green, was set up at Messrs. Nobel's factory, but was unfortunately damaged in an explosion, and the process was ultimately worked by other firms, chiefly by the United Alkali Company and by Messrs. L. B. Holliday. The report of Major Holliday to the annual meeting of the company in 1919 summarised the contributions of the Company to the war and referred particularly to the picric acid manufactured by Green's process. Starting from this process, and by the aid of supplementary devices, the price

was brought down from five shillings to about eighteenpence per pound. On the picric acid we were using during the summer of 1916, the reduction of each shilling per pound represented a saving of about £60,000 per week—say, £3,000,000 per annum! Professor Green's researches without any doubt saved this country very many millions of money. How was he paid? A small salary was paid to his assistant, but beyond his own travelling expenses he never received a single penny for this immense service!

This is how we reward scientists, and the mention of it tempts me to relate another story that was told me by Sir William Tilden, formerly head of the Imperial College of Science. He had been asked by one of the best-known firms in the country whether he could suggest any young chemist who could be responsible for supervising the quality of their steel and other products as well as for initiating improvements and conducting researches into their manufacturing processes. After a time, Tilden wrote to say that he thought he knew of one, and asked what they proposed to pay him? The reply was that they were proposing to start him at £150 a year, with suitable increments if he made good. Tilden's reply was curt. He said he could be of no assistance to them, as he had thought they wanted a chemist, not a laboratory attendant.

The men at the Board of Education rejoiced at the opportunity afforded by the task proposed for me by Haldane, on January 29. Selby-Bigge, the Secretary; Mr. Chalmers, the Head of the Technical Department; Heath, who dealt with University questions; and Sir William McCormick, were indefatigable, and we were helped unstintingly by many other men—eminent in science and industry, and whose advice and co-operation were essential not only to the preparation of a sound scheme but to its successful working. A draft was prepared by the end of March, and on Tuesday, March 30, Pease gave a little lunch to discuss it before committing it to its final shape. Lloyd George, Haldane, McCormick and myself were his guests.

The proposals had developed into a considerable scheme not only for encouraging the development of scientific training and work in relation to industry, but for the necessary concomitant extension of technical, scientific and university training, and no Minister was ever more worried and anxious than Pease was over getting his proposals through the Cabinet. There was a great congestion of business, and munitions questions, as will appear later, were some of the most urgent and difficult. But we had powerful supporters in Lloyd George and Haldane, and on May 4 Pease reported that approval had been obtained and that he had

been authorised to make a full statement on the subject in his forthcoming speech on the Estimates.

His statement, on May 13, was made to a House that was thin, as it usually is when educational topics are under discussion. His proposals may be summarised from the Memorandum which formed the basis of his statement. (The Memorandum itself is printed in the Appendix.¹)

The Introduction to the Memorandum is quoted somewhat fully, because it contains an epitome of our bitter experiences—written at the time—and summarises the case—

" 1. Many of our industries have suffered during the war through our inability to produce at home certain articles and materials required in trade processes, the manufacture of which has become localised in Germany through the superior skill and energy which the Germans have applied to the organisation of scientific research and its application to industry and manufacture. . . . The advantages, sometimes amounting to a practical monopoly, which the Germans have secured over our manufacturers in dyes, drugs, scientific glass-making, X-ray instruments, photographic paper, and many other branches of industry, have been mainly due to the scarcity of scientific research work in this country and the small use made of it by industrial firms. In the United Kingdom, for instance, there are only 1,500 chemists, including analysts, employed in the whole of our industries. In Germany the four chief firms in the one industry of colour-work alone employ 1,000 research chemists. . . . If we are to maintain our industrial position we must, as a nation, aim at such a development of scientific, technological and commercial education and research as will place us in a position to compete successfully with the most highly organised of our rivals.

" 2. The problem is twofold. We have not merely to make the best use of the scientific men we now possess, but to provide a fuller supply in the future. The deficiency in the supply is mainly due to the slight prospect which applied science offers of a useful and remunerative career, and this in turn is due to the fact that the leaders of industry do not appreciate the service which science might render to them, partly because the training in our universities has hitherto been directed to the requirements of examinations rather than to the application of knowledge to industry, and partly because the facilities for post-graduate research into problems of direct concern to industry have hitherto been very inadequate. Further provision for post-graduate work is therefore essential, but we have at the same time to build from the foundations educational steps by which the ablest boys from elementary schools may rise through the secondary schools or technical colleges up to the universities. The pick of those who have completed their university course will become research students or teachers (and in science fruitful teaching and research go hand in hand), and will form a body from which the scientific directors of scientific industry will be recruited.

¹ Appendix No. 2. Proposals for a National Scheme of Advanced Instruction and Research in Science, Technology and Commerce.

" 3. During the last few weeks, Dr. Addison and my staff have been giving very careful consideration to the details of the problem, and as a result of their investigation, in consultation with experts, the following scheme is recommended. The scheme is framed on the assumption that it is desirable to avoid controversy. For that reason the elementary school system is left untouched. Any reform here would involve legislation of a highly controversial nature and also very great expense."

In his speech in Parliament, Pease then set out the details of the scheme. It was designed to give promising students, whether at the secondary schools or at the technical schools, a chance of continuing their training. At the same time, the universities and higher teaching institutions were to be provided with additional facilities for giving the training. Finally, there was to be an Industrial and Research Council, under whose superintendence the scholarships and grants for research in technical, scientific and industrial matters were to be allotted to selected workers. The working of the scheme was to be linked to the Council by agencies representing trades and industries and capable of advising as to the most needed lines of research and of offering facilities for their conduct.

In the case of the secondary schools, it was proposed to extend the period of school life for promising students by the provision of bursaries and otherwise, and to give extra help to the schools which made efficient provision for prolonged teaching. In a similar way additional assistance was to be provided for the technical schools, and arrangements were designed for linking them up to local trade interests.

With regard to whole-time instruction of selected students in universities or higher technical institutions, it was proposed to begin with 120 whole-time scholarships, rising to 300, for students from the technical schools, and a larger number for those from the secondary schools, and to make grants both in aid of fees and of maintenance and equipment to the institutions providing the training.¹

The final part of the scheme proposed that there should be a hundred post-graduate research scholarships for the most promising students who had completed their training in the universities and higher technical institutions. Special sums were provided to aid research in engineering, electrical, chemical and other trades, as well as to help suitable institutions to develop specialised departments according to the needs of local industries.

In order to supervise the working of the final part of the scheme,

¹ The grants for fresh scholarships were stopped by the Geddes Committee as "an economy" in 1921. They have now been renewed by Mr. Trevelyan—February, 1924.

it was proposed to place it under a *Central Council of Commercial and Industrial Research*, responsible to the Minister of Education. The Council was to be as small as possible and was not to represent interests, but to be composed of scientists, traders and other persons selected because of their personal fitness. It was to have panels of advisers representing various industries and scientific and professional organisations, who could be called upon for advice as required. The duties of the Central Council were defined as follows—

(1) They would award the post-graduate and research scholarships and would approve the subjects in which, and conditions under which, the researches should be undertaken, whether in laboratories, workshops, or other places.

(2) They would advise on and assist the individual or grouped researches.

(3) They would also advise on and assist the provision and maintenance of specialised departments in suitable places.

Finally, it was suggested that an Act of Parliament should place at the disposal of the Board of Education the sum of a million pounds for a period of five years to be expended on the advice of the Industrial Research Council.

In the proposals, thus summarised, and presented to Parliament in May, 1915, we have the foundation, and indeed many of the details, of those extensions of educational facilities which have taken place since. The personnel of the First Council of Scientific and Industrial Research was decided upon before the formation of the first Coalition Government, and it was appointed shortly afterwards under Mr. Arthur Henderson. It is now an established part of our national machinery under the Privy Council, and, as its annual reports show, has extended its activities into most of our important industries.

The first Council was constituted as follows—

Sir William S. McCormick, LL.D. (Administrative Chairman).

The Right Hon. Lord Rayleigh, O.M., F.R.S., LL.D.

Mr. G. T. Beilby, F.R.S., LL.D.

Mr. W. Duddell, F.R.S.

Professor J. A. McClelland, F.R.S.

Professor R. Meldola, F.R.S.

Mr. R. Threlfall, F.R.S.

Sir Frank Heath (Secretary).

Later experiences, as in the kindred Council on Medical Research, have justified the separate and quasi-independent existence of this Council under the Privy Council. The widespread results of its work in the establishment of research associations in a large number

of industries have happily preserved it from the attacks of latter-day economists. Up to the present, and owing, I am afraid, mainly to the weakness of Mr. H. A. L. Fisher, the provision of bursaries for promising students and of post-graduate research scholarships has not made the advance that is required, but the whole scheme has justified itself in a thousand different directions, and its further growth and usefulness are only a matter of time.

CHAPTER III

THE BREAK-UP OF THE LIBERAL GOVERNMENT, AND THE FORMATION OF THE FIRST COALITION

The Break-up of the Liberal Government—The Munitions Failure—War Office Persistence in Old Methods—Incidents leading up to the Changes of May, 1915—Liberal Members and the Prospect of a Coalition—The Coalition Formed—Lloyd George for Munitions—The Author as Under-Secretary—Conservative Demands—The Sacrifice of Haldane—Pease—Northcliffe's Campaign.

I CANNOT pretend to give an inside account of the personal and other difficulties that led to the break-up of the Liberal Government in May, 1915, but an outline of the story, so far as I knew it, should stand by itself as a short chapter.

The munitions scarcity was the chief determining cause, and an active Press campaign had had the effect of undermining public confidence in the Government and in the Prime Minister in particular. Finally, the disaster in the Dardanelles and all that followed from it brought matters to a crisis in the early part of May.

The difficulties over the supply of munitions had been longer continued than was commonly supposed. Kitchener and the War Office had been obstinately against the introduction of the civilian element and of engineering firms generally, notwithstanding that it had been obvious since October, 1914, that an output of gun ammunition on an unprecedented scale was essential. The policy adopted by the War Office, and pursued until the end of March, 1915, was that the work could be done only through the existing armament firms, on the supposition, apparently, that they alone could manufacture up to the severe limits of accuracy required for safety. This policy was adhered to in spite of the fact that a special mission to France, in October, 1914, had reported in favour of the adoption of the co-operative system of production then being introduced in France on the initiative of M. Millerand. The engineering employers of this country had not been consulted, and the numberless reports and recommendations which came from the Board of Trade and from responsible employers were sufficient evidence that they

took a different view from those who were advising the War Office.

During January, 1915, on the recommendation of Mr. Rey, Mr. Wolfe, and Mr. Davison, of the Board of Trade, a survey was made of the engineering resources of the country ; and, after considerable pressure, during February and March, Major-General Mahon arranged for samples to be exhibited in different parts of the country. An attempt was made in January to form a local co-operative manufacturing group in Leicester. It was reported to the meeting that representatives of some of the great armament firms had visited the town the day before, and had agreed that a number of local firms should carry out sub-contracts. There could, therefore, be no question of their capacity to execute the work.

This co-operative movement was by no means confined to Leicester, although it received scant encouragement. On March 23 a further meeting was called at Leicester to arrange definitely that work should be started. Dismay was occasioned by Davison, of the Board of Trade, reporting that General Guthrie Smith, Director of Artillery, was unwilling to send representatives to Leicester, or to any other place where negotiations might be on foot. The reason for this attitude was that it had been decided to place no additional orders with any firms for the manufacture of shells until the complete labour requirements of the main armament-makers had been met.

The pressure from Parliament, from the country and from engineering firms became more and more insistent, and was reinforced by the manifest and growing failure of the attempt to force everything through the narrow bottle-neck of the existing armament firms. Nevertheless, the "Armament Output Committee," which Kitchener appointed under Mr. G. M. Booth at the War Office early in April, was limited to taking steps "to provide such additional labour as may be required to secure that the supplies of munitions of war should be sufficient to meet all requirements." Within this narrow instruction, Booth and Sir Allan Smith (who was also a member of the Armament Output Committee) made heroic efforts to move labour in order to meet the requirements of armament firms, and a number of proposals for the organisation of the country's resources were drafted by them.

At the beginning of April, Allan Smith—who was also Secretary of the Engineering Employers' Association—submitted a proposal with a much wider conception of the possibilities, and it is interesting to note that the Prime Minister's statement in the House of Commons on April 8, when he announced the appointment of a Treasury Committee on Munitions under Lloyd George's chairmanship, went

much further than the narrow instructions under which Booth and Allan Smith were working. He said—

“The function of the Committee is to ensure the promptest and most efficient application of all the available productive resources of the country to the manufacture and supply of munitions of war to the Army and Navy. It has full power to take all steps necessary for that purpose.”

The endeavour to draft labour from outside engineering firms in order to reinforce labour supplies in existing armament shops broke down. The obvious truth was that large numbers of firms had the machinery, men and capacity to make munitions in their own works, and neither the directors nor the men had any sympathy with this one-sided and roundabout method of increasing output.

The inner political struggles and difficulties that accompanied this justifiable and growing ferment were not specially known to me, but the sense of most men was aptly expressed in the terms of the motion submitted to the House of Commons by Mr. Hewins on April 21, which was as follows—

“That this House, while welcoming well-considered steps for increasing the mobility and efficiency of labour, is of opinion that it is urgently necessary that the resources of all firms capable of producing, or of co-operating in producing, munitions of war should be enlisted under a unified administration in direct touch with such firms.”

The debate was not hostile to the Government, but its general tenor, and especially Mr. Bonar Law's speech, made it evident that what had been done hitherto by no means satisfied the House or met the requirements of the situation.

Lloyd George—as Chairman of the Treasury Committee—had already requested Sir Percy Girouard to formulate a plan for “the creation of an organisation in England and the Empire which would fully provide for ammunition requirements,” and Girouard's proposals were rapidly prepared. On April 28, Kitchener, influenced no doubt by the increasing outside pressure and by the failure of the former policy, issued a memorandum in the War Office accepting Girouard's proposals. He authorised Girouard and Booth to arrange for munitions supply and made them substantially independent of the Master-General of the Ordnance.

Useful progress was made during subsequent weeks by Girouard and Booth, with Allan Smith, Lord Elphinstone, and Mr. Ridpath as their chief assistants, but much more was needed to secure the mobilisation of all our engineering resources. The struggles to bring in outside firms had now been going on since October, 1914, and very little had been accomplished. Further evidence as to what ought to be done was then available in the Report of Sir E. W.

Moir, Bart., on the French organisation. Moir showed, beyond question, that there was no possibility of meeting the requirements of the case save by getting as much as possible of the work done by competent firms with their own men and machinery.

It all seems so obvious now, but the opposition, although silent, was most persistent, and, because of it, the supply of munitions became the most urgent question of the time. Asquith's speech at Newcastle, based as it was on information and advice received directly from Kitchener, did nothing to improve matters; indeed, in some respects, it made them worse, for the real scarcity of munitions was known to every soldier and to multitudes of others.

Pease told me, on Monday, May 17, that, newspaper campaigns apart, the real shortage of munitions, added to the difficulties with the War Office over the adoption of new methods, and the disastrous results of the attempt on the Dardanelles, made it imperative that a Coalition Government should be formed if possible. The lobbies and the smoke-rooms of the House of Commons that day were full of dismal prophecies, and the feeling in the Liberal Party, which had been specially aggravated by the personal attacks on Asquith, was one of revolt. On Wednesday, May 19, when the decision to form a Coalition had been announced, an indignation meeting of Liberal Members was called. In response to a special message, Asquith himself came up to the meeting. The result was a remarkable personal triumph. In twenty minutes he came away with a unanimous vote of loyalty and confidence. He revealed to them the difficulties of the position, and implored them to trust him. He went so far as to hint that if he could not form a Coalition with their approval, there would be no course left to him as leader of the Liberal Party but to resign. It was not a matter that could be talked about, but one of the most important reasons why a break must be avoided at all costs was that the treaty of co-operation between the Allies and Italy had been signed at the end of April.

On Wednesday, May 19, Arthur Henderson told me that he had had an interview with Asquith, that he had had a "most uncomfortable quarter of an hour," but that Labour was going to come in and that he himself was to have a position in the Cabinet. The outer fringe of Under-Secretaries, of which I was one, heard only the gossip. As a whole batch of Cabinet Ministers and Under-Secretaries had to make way for the new-comers from other parties, I resigned myself to the inevitable, although I understood from Henderson—who knew about the Industrial Research Council and other schemes that had now been approved and were going ahead—that I was to remain and help him. Pease had been led to expect

that he would become Chief Secretary for Ireland, and the first authentic news I had that the fates had decreed otherwise was derived from the morning papers of Wednesday, May 26.

Under-Secretaries had not then been dealt with, but they soon were. Shortly after I arrived at the office that same morning, a message came that Lloyd George wanted to see me. I was sent to him at the Board of Trade and expected that a friendly Minister for whom I had done a good deal of work was going to tell me that I must make room for somebody else. It was a great surprise when he said, "You know I have to be Secretary of State for Munitions, and the Prime Minister and I have decided that you must come and be my Under-Secretary and help me to run the show." I began to put in a plea for the work I was doing at the Board of Education. He said: "These things are not going to be let down, but this is a command." Montagu and McKenna turned up at that moment, and Montagu in his most fatherly manner informed me that "we are not going to stand any nonsense about your affection for things at the B. of E.; somebody else must look after your heart's delight there." Simon (who had refused the Lord Chancellorship, and accordingly that morning had been saluted by Lord Justice Darling as "the maddest lawyer in London") also dropped in to wish us God-speed. Afterwards, in the barely furnished Board-room at No. 6 Whitehall Gardens, Lloyd George sitting on the corner of the big table, Sir Hubert Llewellyn Smith, J. T. Davies (Lloyd George's private secretary) and I discussed what we were to do and how to do it. We constituted at that moment the complete staff of the Ministry of Munitions.

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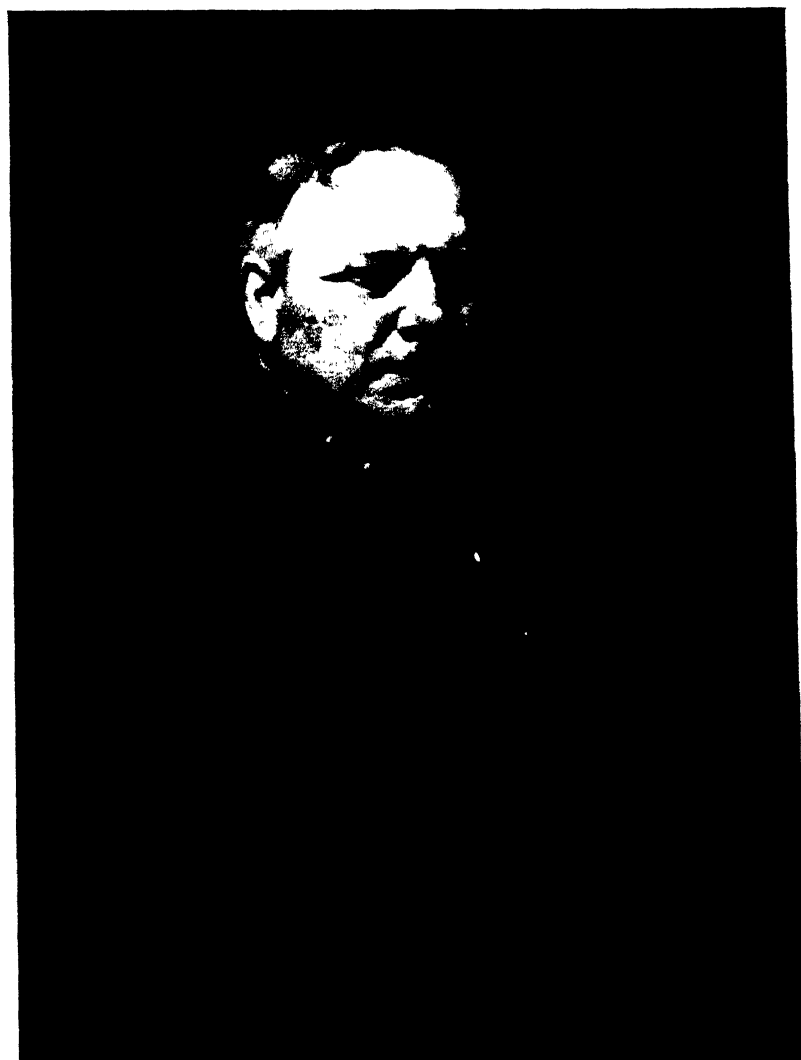
Before taking up the story of work at the Ministry of Munitions, there are three matters arising out of the change of government that I must comment on. When the decision had been taken to form a Coalition and the Conservatives had agreed to participate, the difficulties as to men and places asserted themselves. During the week ending May 24 we were told that the demands of the Conservatives mounted higher and higher, and there was nearly a split on Monday, May 24, when Asquith was reported to have put his foot down and, in effect, to have said: "These are my terms—take them or leave them."

The one thing, however, in all this episode that caused bitterness and anger was the dropping of Haldane. I understand that the Conservatives insisted upon it. It was nothing short of a weak surrender to one of the most shameful and unjust campaigns that have ever disgraced British public life. I do not know what induced Asquith to give way. It was a wrong both to Haldane and to the

best interests of the nation at that time, and it reflects very badly upon Asquith, as well as upon those who brought pressure to bear upon him. Had it not been for the work of Haldane, there would have been no organised Expeditionary Force, with the fine Staff that brought it into the field of battle in a remarkably short time and thereby saved the Channel ports from occupation. The British Staff Book, for which he was responsible, was alone sufficient to justify the retention of his services at that time.

Petty men do not understand his type; his grave and somewhat ponderous courtesy and his overflowing knowledge of men and things seem to excite their jealousy and make them put him down as tedious and discursive. His conversation, it is true, as he talks to you with his big head bent forward and with a certain deference to his listener, is not very digestible for those whose normal intellectual diet consists of newspaper headlines and spicy paragraphs dictated by some universal provider. When perplexity and danger beset us is not the time for the State to dispense with the services of men of his type. It was a poor business that those who knew his worth should allow their judgments to be stampeded by impatient and prejudiced clamour. Was he any less fitted to help us to fight the Germans because he was a master of the German language and had been a close student of their philosophy and arts? Is it a disadvantage to have a man in your company who has a good understanding of the enemy's frame of mind? Surely not. I never could understand what was really behind the extraordinary venom and prejudice directed against Haldane. Many quite decent people became so influenced that they accounted him unpatriotic because, apparently, of the extraordinary misrepresentations invented regarding the mission to Germany he had previously undertaken at the request of the Government. I remember that my wife one day told me, when she had been lunching with a friend who was a strong Conservative, that her friend's feelings had been so worked upon by the anti-Haldane campaign as to convince her that he was sympathetic to the Germans and not to be trusted. It was an indication of the length to which this contemptible campaign had gone when rubbish of that kind could be accepted by a sensible, well-educated and patriotic lady, on the ground that Haldane was intimately familiar with and admired German philosophy and literature. Asquith ought to have spoken out boldly for a colleague so maligned, especially for one who had, perhaps, done more than any other man up to that moment to aid us in the war.

On many occasions afterwards, when difficult questions of organisation and administration came up, I went to Haldane for criticism and advice. He was ever ready to help, for he is too great a man to



sulk, and did not scorn to assist a minor Minister in relatively small affairs.

All of us, I think, had a feeling of personal loss in the loss of my first Departmental Chief and good friend, Jack Pease. In earlier days, as the Chief Whip, he had been to me a lofty, far-off creature wrapped in the mystery attaching to high officials, and we had had few dealings with one another until I became his Parliamentary Secretary at the Board of Education. He told me then, I remember, with complete frankness, that he did not pretend to be an expert on matters of education, but that, as Minister of Education, he meant to do whatever he could to give our children and young folks a better chance—that he expected me to do what I could to help him, and that he would back me up if I did. No man was ever truer to his word or more completely free from any petty-mindedness in the keeping of it. Some of the chief officials, I think, before we got to understand one another, were a little inclined to resent a Parliamentary Secretary who was active on matters of policy, and who was not disposed to be content with answering questions in the House in the words given to him on the days appointed, and otherwise be seen occasionally but not heard. It was not Pease's idea, and it was not mine. He wanted no passengers in his boat. One condition applied to our co-operation throughout—complete frankness. Many a smaller-minded chief might have objected to my having breakfasts with the Chancellor of the Exchequer and discussing educational projects with him or with the Lord Chancellor, but Pease never did. He knew all about these things both before and after the event, and no assistant could have had a better guide than was afforded by his shrewd and penetrating common sense. He was justly proud of the proposals that he was able to submit to Parliament, and bitterly disappointed, as were we all, that the course of events prevented his superintending their execution. Before the break-up of Asquith's Government, it was intended that Pease should succeed Mr. Birrell as Chief Secretary for Ireland, and he was anxious to do so. In view of the fact also that a Conservative was not likely to be appointed to that office, he expected that he would continue in the Government in that capacity. I understood from him that such was Asquith's intention. A part of the Coalition agreement, however, was that a certain number of offices, both in the Cabinet and out of it, should be held by representatives of the different parties, and Pease had to make way. On several occasions since then, I have been present, either in my own case, or with others, when a Minister bade farewell to his office, but I do not think that I have ever seen men more genuinely

sorry to lose a chief and a friend than was the case at the Board of Education when Pease went round saying his good-byes, from which he did not omit the messengers and porters.

In the course of this narrative a good many hard things may be said about the Northcliffe Press, although none of them will disturb their equanimity. In connection, however, with the exposure of the munition shortage, the methods adopted by these papers may have been censurable on many grounds by orthodox people, but Lord Northcliffe did not overstate the case and he rendered a real service in a very vital matter. The facts were so bad that they seemed to me to justify almost any action that sufficed to secure decided action and the scrapping of methods that were glaringly insufficient. Northcliffe at that time was not even an acquaintance of mine, so that I know nothing whatever of the motives which actuated him. It may or may not have been a good newspaper effort, but it was of immense service.

CHAPTER IV

THE BEGINNING OF THE MINISTRY OF MUNITIONS. THE STATE OF SUPPLY AND THE TRANSFER OF FUNCTIONS FROM THE WAR OFFICE

SECTION 1

The Small Beginning—Girouard—Booth—The Cabinet Committee—Kitchener—Curzon—Geddes—Trench Warfare—Some Tasks allotted—Ascertainment of the Position—Bingham—An Intelligence Department—Layton.

SECTION 2

THE MUNITIONS POSITION AT THE COMMENCEMENT OF THE MINISTRY

The Position at the End of May, 1915, as to Guns, Ammunition, Rifles, Machine-guns, Trench Warfare Supplies and Explosives.

SECTION 3

THE TRANSFER OF FUNCTIONS FROM THE WAR OFFICE

Work of Brade and Llewellyn Smith—Attitude of Kitchener—Two Serious Mistakes—Transfer of the Ordnance Factories—Further Difficulties—Transfer of the Ordnance Board—Du Cane becomes Director-General of Design under the Ministry of Munitions.

SECTION 1

THE story of munitions is not so much one of shot and shell, of rifles and machine-guns, of helmets and gas supplies, of tanks, railway engines, ploughs or aeroplanes ; it is, rather, of the men and women behind the scenes who laboured at their ever-growing task ; of their hopes and fears, disappointments and successes, and of the novel and sometimes tyrannical expedients they were driven to adopt, with the governing passion, to deliver in time the things that were wanted by the men at the Front. The figures of output are great and splendid, but the tale they tell us is that of people struggling through a maze of difficulties to ultimate triumph.

It was a glorious job. At the first meeting of the four of us in Whitehall Gardens, the dominant resolve was that there was this one thing to do and that no other distraction, domestic or political, should be allowed to stand in the way at any time. That was the

spirit also of the staff that gathered around us and with which it was my high privilege to work for two years.

The best way, perhaps, to throw light upon the beginning of things is to be guided by my diary, which was kept up in those days with many groans and only by the aid of my loyal Secretary, Mrs. McVittie.

On Thursday, May 27, Lloyd George, Llewellyn Smith and I renewed the discussion of ways and means, and it was arranged that I should report as soon as possible on the actual position of orders, the prospects of deliveries, the extent of requirements and existing stocks, as well as assist in searching out of men suitable to undertake responsible duties. Llewellyn Smith, as the Secretary, was to report upon the organisation of a department that could function.

During the discussion we were joined by Girouard and Booth from the War Office, who, with their small staff, were to be transferred to us.

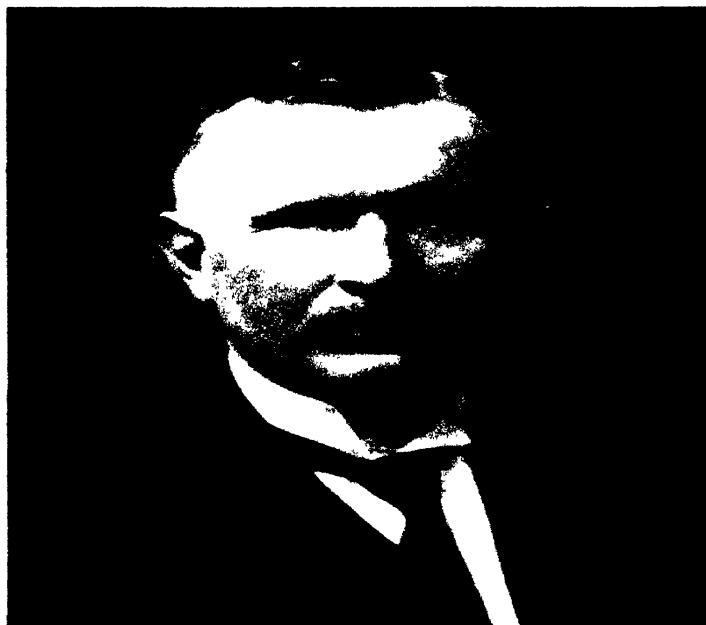
Girouard was a little unfortunate from the start with Lloyd George, as he was over-inclined to discuss his status and that of Llewellyn Smith; how papers and persons were to have access to the Minister, and matters of that kind. These things are important as an office develops if the machinery is to work smoothly, but they always annoyed Lloyd George, who hated details and was shrewd enough to pass over organisation questions to other people. The vital thing just then was to find out as clearly as we could what munitions were wanted and to get hold of the right men to help us to supply them. With these questions uppermost, Lloyd George was impatient, and was disposed to render less than justice to Girouard's knowledge and capacity, which proved invaluable in many ways.

During this conference we were visited by Lord Crewe and Lord Curzon, who had been appointed members of a Cabinet Advisory Committee to take the place of the former Treasury Committee on Munitions. Arrangements were made for a grand sitting in the afternoon, and the names of various possible helpers were also discussed; amongst them was a Mr. Eric Geddes, of whom Lloyd George had heard that day from Lord Grey in a letter that gave a glowing account of Geddes' doings on the North Eastern Railway. I was appointed to interview him the following morning.

It emerged in our talk together after the morning conference that there were still some difficulties about minor ministerial offices, and my own appointment was being called in question. Henderson apparently considered that he had received assurance of my continuing at the Board of Education in order to carry on



Portrait by Mrs. J. G. G. G.
 SIR ERIC GEDDES, G.C.B., ETC.



Portrait by Mrs. J. G. G. G.
 SIR H. EDWARDS, S.M.C., K.C.B.

with the various schemes that I had helped in framing, so that there was a proposal to send me back to Education and for Lloyd George to have Mr. Harold Baker as his assistant. But Lloyd George and the Cabinet Committee were averse from changing the team now that we were in harness, and nothing came of it. Even in that short time, the work at the Board of Education seemed to belong to a dim past, and it would have been a bitter disappointment to me—much as I loved the work of that office—to have had to return to it then.

The afternoon conference with the members of the Cabinet Committee was attended by Kitchener, for a part of the time, as well as by Girouard, Booth and Sir Frederick Donaldson—the Director of Woolwich Arsenal. Whatever might have been the difficulties Kitchener had raised beforehand, he was big enough to put them altogether behind him and to help us in every way. Amongst other things, he gave me a chit, which was a command to all and sundry to give me promptly and without reserve all the information I required on munitions. This was the first occasion also on which I had had personal dealings with Curzon. On that day, as afterwards throughout many years of close association, he was keen and kindly and clear-headed, mastering the details but never losing sight of the main objective. For the first time, too, that afternoon, I heard of Major-General Sir Louis Jackson—then Colonel Jackson—who had begun to deal with gas questions at the War Office, and instructions were given to me to take up Trench Warfare questions.

Sir Eric Geddes made his first entry into Government business on Friday, May 28, 1915. According to appointment, I interviewed him at 10.15, and the impressions received can best be given in the words of the report which it had been arranged I should make to Lloyd George.

I went upstairs to Lloyd George, leaving Geddes in my room. I said: "Geddes is downstairs, and I have had a talk to him."

"Well?" he asked.

"He'll do," said I. "Unless I'm much mistaken, he will get a move on."

"Fetch him up," said Lloyd George.

So I fetched him up and they met for the first time.

They both talked. Sometimes they both talked at the same time. Geddes made no pretence of hiding his light under a bushel. He told us, I remember, that he was ambitious for a big job. Lloyd George promptly said that he would find him one. Girouard was then sent for, and it turned out that he knew Geddes well and welcomed his enrolment. It was accordingly arranged that Geddes

should be present at many of the conferences that we had planned and should link on to Girouard and Booth in order to survey the work generally for the next two or three days. Some of the returns of existing orders and supplies had then come in, and as it seemed that the rifle position was urgent, he was instructed to explore the position in regard to them.

Big questions of policy as to the programme of requirements had already emerged, and these Lloyd George took special charge of.

From the first day deputations from municipalities and from big engineering centres began to crowd in upon us with offers of help. During the first week they were mostly received by Crewe, Curzon and myself, and afterwards, until the department began to function, the reception of them mostly fell upon myself.

On Saturday of the first week, Jackson and Dr. Beilby (now Sir George Beilby)—Chief Adviser of the War Office on chemical questions—gave me a first intimate sight of the ghastly abyss that gas warfare was opening out before us. It was evident then that, whether we liked it or not, we should have to create a special branch for supplying counter-offensive material, whilst the defence of our own men raised allied questions belonging particularly to the Army Medical Department and its chemical advisers.

By Sunday, May 30, those of us who had been examining different questions were ready for the first full conference. It was held at Lloyd George's house, at Walton, and I picked up Geddes on the way down. For a part of the journey Arthur Lee (now Lord Lee) also came into touch with us for the first time. He was then on Field-Marshal French's staff, and it was arranged that he should give Lloyd George some first-hand information on the Monday.

The Minister's family was sad that day. Megan was making courageous but not too successful efforts to be cheerful, whilst her two brothers were in training and her sister was to go to a base hospital the following day.

We were joined after lunch by Donaldson from Woolwich, by Llewellyn Smith and Sir W. H. Beveridge. It was arranged that Beveridge should take general charge of the Labour Department, and he continued to occupy that thankless and difficult post until he left us to join the Ministry of Food, where, in helping Lord Rhondda to devise the food rationing system, he achieved a signal administrative triumph.

The first obvious conclusion that emerged at this conference was that the position of rifle supplies knocked the bottom out of any demand for conscription for some considerable time to come, since it would obviously be futile to enlist masses of men, take them from work and allow their wives and families separation allowances for

many months before they could be given a rifle to handle. Geddes therefore was definitely put in charge of rifle production.

The discussion lasted until late. One of the conclusions that emerged was that there was an immediate, if perplexing, task in securing co-ordination and proper direction of the multitude of agencies that were coming into existence. Nevertheless, in order further to encourage production in Birmingham, Manchester, Liverpool and other big cities, Lloyd George determined to visit Manchester and Liverpool the following week.

We each arranged to undertake certain sections of work, my own being to continue interviews with engineering firms and with representatives of municipalities with a view to examining the form of local and central organisation required and to make further progress with the Report on the munition position.

In the preparation of that Report acknowledgment must be made of the ready help that, with one or two exceptions, was given by the officers at the War Office. Their patience was inexhaustible and nothing was too much trouble for them. In particular does this apply to General the Hon. Sir F. R. Bingham, who was then Colonel Bingham, the Deputy-Director of Artillery.

The task of that heroic and capable officer was an impossible one. He was labouring away night and day with an utterly inadequate staff in a little room trying to piece together discordant deliveries and to arrange for their assembly, completion and transport. The first time I saw him he was haggard, weary, overdone and well-nigh in despair, ransacking this country, India and the Dominions for things that were found to be short. He received every week a return from each armament factory showing deliveries for the week and the estimate for the following week. These, together with his personal knowledge of the extensions of plant that were being made, and an estimate of receipts from overseas, formed the basis of the figures that had previously been supplied to the Cabinet Committee on Munitions. Under the system then existing, and owing to its very confidential character, Bingham did the copying himself.

The figures of deliveries of shell-cases from contractors were far from representing complete rounds of ammunition. All the fuses, cartridge-cases, shell bodies, primers and gaines, had to be collected, inspected and filled at Woolwich. Latterly, also, owing to the increasing pressure of work at Woolwich, returns had not been made weekly. At that time the supplies were a mere trickle compared with what was projected, and, if the contractors had supplied at the promised time even a sensible percentage of the deliveries they had undertaken to make, the whole system of saddling on one splendid officer's shoulders with a few assistants in

a stuffy room or two the keeping and assorting of these records from odd scraps of memoranda would have utterly broken down.

It was evident that, whilst every precaution should be taken to secure secrecy, muddle and confusion could only result unless a trustworthy Information Department were created which could receive all the information, beginning with the needs of the different factories for raw material and embracing all stages down to completion, inspection and delivery. Only in this way could the information be co-ordinated and classified so that the shortage of any component or material, or the delays of any process, be rapidly ascertained and the necessary arrangements made for meeting the necessities of the case.

Llewellyn Smith therefore was directed to turn his attention to the organisation of a proper Intelligence Department, and he brought in Mr. W. T. Layton, C.H., who had been assisting in statistical work at the Board of Trade.

Many Oxford and Cambridge dons turned their hands to munitions problems in those days, and many were the great men of business who looked to them for help. But none of them could have done better work than Layton. He became head of the Statistical Department of the Ministry, and remained there, trusted by everybody, until the end of the war. He and the assistants whom he got together would tear the truth out of almost any mass of figures, and I never knew them guilty of hiding it when it was unpleasant.

The Preliminary Reports that I made to Lloyd George on June 5 and 9 were so disquieting that the Prime Minister decided they had better not be circulated, and Cabinet Ministers were told to come and see them in my room, and I instructed Layton to prepare independently a fuller and more detailed report. When prepared it revealed that the statement as to rifles, given in the earlier memorandum, had been somewhat more unfavourable than was warranted, because the rifles for the Second Army and a portion of the First were still at home and were supplementary to those in France. Apart from this, the later document worsened rather than improved the figures given in the earlier one.

SECTION 2

THE MUNITIONS POSITION AT THE COMMENCEMENT OF THE MINISTRY

Any detailed exposition of the state of munitions supply, as revealed in the return I made and supplemented by that of Layton,



MAJ. GEN. SIR PERCY GIROUARD



MR. G. M. BOOTH



GEN. THE HON. SIR E. R. BINGHAM



MR. W. T. LAYTON, C.H.

would be too technical to be interesting to the general reader, and I shall therefore only summarise it in general terms. Some figures and tables are, unfortunately, inevitable, but for the most part they are given in the Appendix.¹ A return to them will be required when describing the first programme and what it involved, and comments will mostly be reserved until that point is reached.

GUNS

So far as orders had been given for guns, the deliveries of them showed a better record than for any other class of supplies, but the orders given were unfortunately very far short of what the requirements proved to be. The general intention at that time was to provide equipment for from sixty to seventy divisions, but the requirements of each division and for general army purposes, as they had then been formulated, were less than when the programme came to be fully detailed.

The lighter field guns—15-pounders and 13-pounders—were then being used to supplement the new 18-pounder guns, but the numbers available of all three types put together were only sufficient to equip twenty-eight divisions on the basis then required. It was intended that the older howitzers—4·7" and 5"—many of which were becoming very worn, should be replaced by new 60-pounder guns and 4·5" howitzers. The position was, that on the existing establishment, the 4·7" howitzers and the 60-pounders, taken together, were sufficient for thirty-one divisions, and the 4·5" and 5" howitzers, taken together, were sufficient for seventeen. The heavier guns, both as to the numbers available and of those on order, were so few that they were utilized only for general army purposes.

The table in the Appendix shows the position of deliveries as compared with promises on June 1. With the exception of the 4·5" howitzers, it was fairly satisfactory. The actual numbers of the heavy guns available in the field at that time also are given in the Appendix.

The gun position, in short, amounted to this, that in no case were there guns for more than about half the number of divisions required. If there had been no arrears in delivery, the shortage would still have been a very great one in the medium types, and in the case of the heavier guns the orders for those necessary to provide our full equipment had not been given.

¹ Appendix No. 3.

AMMUNITION

The supply of gun ammunition was unfortunately worse than the supply of guns, for, whilst the guns available were short of the numbers required, little more than half of them were fully supplied with ammunition. A table showing the percentage of the existing guns for which the ammunition issued was sufficient is reproduced in the Appendix, and it will be seen that the only one which had a full supply was the 6" gun. Seeing, however, that there were only eight of these in the field, the figure was negligible. The ammunition for the different guns was prescribed on a daily ration, and at that time the ration was less than was afterwards prescribed, but there was no use in increasing the ration under the circumstances then existing.

Apart from the supplies of ammunition immediately available for the guns, it was stated to be desirable that there should be forty-two days' supply on the lines of communication. The complete figures of these reserve supplies were not available until a few days after the first Report was made, and it was to be expected that they would be inadequate in view of the general shortage. A table showing the position for the different types is given in the Appendix. The 60-pounders, of which there were not many, were the best supplied, with twenty-two days' reserve, and the eight 6" guns had fourteen days'. None of the others had more than seven days' supply, except the 18-pounders, which had twelve.

The causes of these great shortages of supplies were necessarily the subject of prolonged and critical examination, and much more will be said of them, but at the outset it should be pointed out that there is no necessary correspondence whatever between the delivery of the shell-cases—commonly described as "shells"—and the numbers of "complete rounds" of ammunition. A complete round is the shell-case, with its cartridge-case, fuse and all other parts, inspected, assembled and filled ready for the artilleryman's use, and any component of the completed round that exists in the smallest numbers marks the limit of the numbers that can be provided, even if the arrangements for filling them all are adequate.

The shells were classified as "high-explosive" and "shrapnel," the latter containing the leaden bullets liberated on explosion; the former causing destruction by the scattering of their own fragments and the force of the explosion. The relative proportions of these two kinds of shell need not concern us for the moment, but some differences in the ingredients and methods of filling were necessarily involved.

An important contributory cause of the shortage of complete

rounds was the short supply of one or other of such component parts. It was this that accounted for the lamentable figures of deliveries of high-explosive shells during the last three weeks of May. The promises for 18-pounders were for 118,500 each week: the actual deliveries, however, were only—

5,881
9,885
and 16,699

It was to be expected that a certain percentage of arrears would arise in the rush and hurry of the war, especially from the less experienced makers or from orders recently given. But, unfortunately, those excuses could not be sustained with respect to most of the orders. The position up to that date with regard to two of the largest and most important firms was as follows—

	Promises.	Deliveries.	Arrears.
Firm A . . .	907,550	235,550	672,000
„ B . . .	1,020,925	308,090	712,835

A few further illustrations of these extraordinary discrepancies between promises and performances will be found summarised in a short statement in the Appendix, and the record of some of our later experiences will compel a return to the subject; but, for the present, it is sufficient to say that the staggering contrast between the deliveries that had been made and the orders that had been accepted were in themselves amply sufficient to justify the agitation that had preceded the formation of the Ministry. Some firms did manifestly better than others, but, unfortunately, their performances made little difference to the net result.

A further contribution to explaining the discrepancy between the deliveries of different parts and the provision of complete rounds of ammunition to the Army was to be found in the great complexity of patterns. There were, for instance, twelve different kinds of fuses being supplied at that time, and many of them required special adaptors before they could be fitted to the shells. This process of bringing together the parts was generally described as "marrying up," and an illustration of the inequalities it gave rise to was derived from the first figures that became available when Layton's arrangements for analysing the causes had been got into working order. In the seven weeks ending August 10, although every conceivable effort had been made to secure complete marrying-up of parts, the deliveries of shell-cases for the same weeks totalled 500,000 more than the output of complete rounds of ammunition that could be got together because of various inequalities in deliveries and filling arrangements.

An important question of future policy arose out of the examination of the first returns; namely, the extent to which we could allow ourselves to become dependent upon supplies from America and Canada. In the first quarter of 1915, five-sixths of the 18-pounder shells had come from home sources, and about two-thirds of the 4.5" howitzer shells; but unless some alteration were made, the dependence upon overseas supplies, according to the orders that had been given, would have enormously increased by the spring of 1916. If the orders were completed, nearly two-thirds of our supplies in the first quarter of 1916, both for 18-pounder and for 4.5" howitzer shells, would be derived from overseas sources. It would never do to be dependent for more than half such ammunition from outside our own country, and a great proportionate increase in the home production was called for in order to preserve a proper balance, apart from the need for an increase in output all round.

RIFLES

At that time we nominally possessed 1,433,000 rifles, but when deductions had been made for those required for Garrisons, for the Home Defence Forces and Reserve Units, the number we could rely on for war purposes abroad was reduced to 538,000, or sufficient to equip thirty-three divisions. When the necessary allowances had been made for wastage and for factory stock, there were about 172,000 left available for the new armies at home. The last-mentioned figure explains an earlier reference to conscription, and why it was that the Home armies were insufficiently supplied.

The weekly output of new rifles from our own factories was about 12,000, but it was steadily increasing. Large orders had been placed abroad, but up to that time no overseas supplies had come in, apart from 130,000 that had been purchased. It was estimated that for effective war services a million additional rifles might be available by February, 1916, and twice that number within the following five or six months.

MACHINE-GUNS

The position as to machine-guns was worse than that of shells. The Army was demanding more and more of them, and the War Office, after making allowance for wear and tear, forecasted a standing requirement of 13,000 machine-guns of different patterns. Twice that number, however, must be produced each year, as the life of a machine-gun was only six months.

The figure of need, just quoted, was available for us at the very first, and it was difficult to understand why more orders had not

been placed. There were in existence at that time effective orders for only 3,344 machine-guns. It is true that an additional 2,000 had been ordered from abroad at the beginning of June, and there were optional continuation orders for another 2,000, but they could not affect the position for a long time to come. From the beginning of the war up to the end of May, 1915, the deliveries of machine-guns had been 1,115, and, compared with promises for delivery, they were rather less than half of what had been promised.¹ Briefly, there were machine-guns sufficient to supply twelve divisions on the somewhat modest scale of requirements that had been stated up to that time.

TRENCH WARFARE SUPPLIES

Up to the end of May, 1915, the supplies of trench warfare munitions had been negligible, and no account of them could be included in the first Report, as there were no supplies worthy of note. The supply of them was taken over by the Ministry towards the end of June, and it then appeared that there was a *daily* requirement of 70,000 hand grenades (of which 30,000 were Mills grenades) and a *weekly* supply of 2,500 Mills grenades and trifling numbers of other types.

The orders placed for trench mortars and howitzers of different kinds represented only 15 per cent. of the stated requirements, and the supplies were insignificant.

EXPLOSIVES

Some time before the Ministry came into existence, Kitchener had asked Moulton to be responsible for the supply of explosives, and he never made a wiser selection. When the Ministry was constituted, Moulton's department was the only one that was in advance of the demands made upon it. Later on, a chapter will be devoted to explosives, but what a comfort this discovery was at the beginning of June, 1915! I can feel now the sense of relief that came over us when Moulton's statement, with its carefully calculated future plans, was placed before us. Hitherto every enquiry had revealed lack of foresight, delays, and a lamentable absence of management. It was like having to cut our way through a dark forest, with nothing to guide us, but when we came to this fresh place there was open space and light. Moulton and his staff had done magnificent work already, and their wise management and clear-sighted capacity renewed our energy and gave us hope and confidence.

¹ The promises for delivery up to the end of May, 1915, were 2,482.

SECTION 3

THE TRANSFER OF FUNCTIONS FROM THE WAR OFFICE

The first transfer of functions from the War Office to the new Ministry was effected with remarkable smoothness. The trained artillery expert, conscious of the thousand and one difficulties attendant upon the supply of intricate munitions, was naturally anxious at handing over all this business to civilians. Moreover, they were still a very long way from discovering all the causes of blind shells, so that there were special reasons why the young, grabbing, hustling Ministry should not be welcomed by the expert.

When, therefore, those of us who were in charge of the business got down from generalities to details, with the need to settle them quickly, substantial drafts had to be made on the tact and good temper of all concerned. It is invidious to make distinctions, but a great share of the credit for the smooth transfer attached to Kitchener, Sir Reginald Brade and Llewellyn Smith. Kitchener, so far as I knew anything or had any dealings with him, took the large-minded view all the time and acted up to it. He said to me one day: "You have the job to do, and you must have whatever is necessary to enable you to do it well, and I shall help you to get it." Brade and Llewellyn Smith were practised hands at office organisation and departmental negotiation. Brade took care that Kitchener's directions were given effect to fully and without pettiness, and his influence had much to do with the friendly and helpful attitude of the many anxious officers concerned. Llewellyn Smith was in his element with a job of that kind, for in quiet pertinacity and ingeniousness of device he has not his superior in the Civil Service. The War Office welcomed the transfer of their Labour Department, lock, stock and barrel, and no employer or trade union secretary will wonder at that.

There were, however, two serious blunders made in connection with the first transfer of functions, and the responsibility for them rests on both departments. We did not ask enough, and the War Office did not surrender enough. To some extent we had inexperience as an excuse, and the Master-General of Ordnance perhaps did not want to part with more than he was obliged. The Ordnance Factories, of which Woolwich was the most important, were not transferred, nor was the Ordnance Board, which was responsible for designs, specifications, patterns and tests, most of which were prepared or conducted at Woolwich under its direction.

These omissions led to numberless difficulties from the beginning.

With the wide extension of munitions manufacture that was taking place, we were bombarded every day for samples, drawings, designs and specifications, and a host of technical questions kept coming up which affected the earliest as well as the latest stages of manufacture and supply. But both of these were under the control of the departments which had not been transferred. It was like working in a great chamber with a narrow opening at each end, neither of which we commanded. Drawings and specifications had to be supplied before anybody could begin manufacture, as well as gauges, and it was the business of Woolwich and the Ordnance Board to supply them. When the manufactured articles had been delivered, they had to pass through Woolwich for filling and completion. The result was that, whilst people all over the country were bursting with enthusiasm and with the capacity to help us, we had to look elsewhere for the supply of the things necessary for the very beginning of manufacture; and many were the indignant remonstrances that I had to receive at their not being forthcoming. Furthermore, when a considerable volume of supply came in, the arrangements at Woolwich for filling, assembly and completion were found to be very inadequate, and we were not in a position to deal with the inadequacies.

One or two illustrations may be given, not for the purpose of suggesting that blame should be attributed, but as illustrating the facts of the case. Those whose business it was to produce designs and specimens were doing their best, but the arrangements were not adequate to meet the vast new demand. For instance, having mobilised a considerable number of firms who could make fuse parts, Elphinstone had to report to me on June 16 that Woolwich could not supply a single specimen of No. 100 fuse or even working drawings for it. Similarly, several weeks passed before the drawings and specifications for the different trench warfare munitions were obtainable. Early in August it was ascertained that the provision for filling shells at Woolwich was 100,000 per week less than the delivery of shell-cases, and the sidings were becoming blocked up with material awaiting filling. The capacity for filling that part of the shell which is called the gaine was proved to be 50,000 per week short of the supply, notwithstanding that the work was going on to the utmost limit of the filling capacity and the people were working night and day. Had it not been for the help given by the Navy in filling our shells in the early autumn of 1915, before the new filling factories were complete, the position would have been much worse than it was.

Following on the conference at Walton on Sunday, June 30, Donaldson submitted a useful memorandum of suggestions for

speeding up the work in the Ordnance Factories, as well as for creating agencies in different parts of the country competent to deal with assembly and inspection so as to avoid overwhelming the Ordnance Factories, but a great deal of this could not be achieved unless the Ministry had charge of the business and could combine it with its other activities.

On August 4, therefore, Lloyd George decided to press for a complete transfer of the Ordnance Factories to the Ministry. He may have had considerable difficulties to contend with in the Cabinet Committee, but it was a great misfortune that he did not there and then urge the transfer not only of the Ordnance Factories, but of the Ordnance Board itself which settled designs. The Cabinet Committee supported our view as to the need for the transfer of the Ordnance Factories, but as the days passed and no decision was reached, the position became more and more difficult. It was settled by the Prime Minister himself on Thursday, August 19, and the manner of its settlement had its lighter side.

On the previous Tuesday, about 7.30 in the evening, I went across to No. 11 Downing Street, to report to Lloyd George on various matters, and found him on the sofa in the drawing-room surrounded by masses of papers, with Winston Churchill pacing up and down the room. Lloyd George said he thought he must have an attack of influenza, so for the time being I turned physician and insisted on taking his temperature. It was only a degree above normal, but that was too much. I therefore asked Winston whether, if he were a therapeutic agent, he would regard himself as a sedative? He said that on the whole he was disposed to think not. We therefore agreed that he had better go, and he went.

Lloyd George had already arranged that the Ordnance Factory case should be submitted to the Prime Minister for settlement, and I was instructed, in case the influenza developed—which it did the next day—to see Asquith and obtain a decision. This I accordingly did, and found that he had gone into the case with elaborate care and entertained no doubt that we must take over all the factories concerned, and he agreed upon the main lines of a letter to give effect to this decision.

The day following this decision we set up a Board of Management for the Ordnance Factories, of which Sir Frederick Black (who had then come over to us from the Admiralty) was Chairman, and Geddes the Managing Director. This body continued to direct these factories for a long time, and consisted, in addition to Black and Geddes, of Sir Glyn West, Sir Charles Ellis, and Sir Sothorn Holland, together with representatives of the Ordnance Department of the War Office and of the Admiralty.

The transfer of the factories, although it proved to be of immense help, by no means got us out of all our troubles. The delays and difficulties over designs, alterations in pattern and tests continued, with exacerbations now and then, until November. On Friday, November 6, Lloyd George instructed me to get hold of Black and, with him, draw up a statement of our case for the handing over of the Ordnance Board, its Store Department, Testing Station, and the rest.

The case, I think, is well enough expressed in the following extract from the note which I submitted to Lloyd George—

"The arrangement should, I think, be based on this understanding. The War Department should determine what forces it should employ and with what munitions and to what extent they should be equipped, and *the Ministry of Munitions should be so staffed and organised that it can deliver to the War Department, in a fit and tested condition, and ready for service, the munitions asked for.*¹

"Every day questions small or large arise in connection with the production of munitions which require reference to the Ordnance Board. In great part they are questions arising out of difficulties of manufacture, demanding adjustment, or alteration of design in some form or other, such as the type of a detonator, modification of a fuse, gun carriage, and so on. Sometimes there are suggestions for improvement which occur in the course of manufacture. The settlement of these things should be under the same authority as that which is responsible for the manufacture and supply of the goods concerned, and its expert branch, being in daily working touch with the different producing departments, should be augmented by the addition of expert representatives responsible for bringing up and obtaining determination as quickly as possible of the many questions which arise in the different supply branches.

"Setting out design, the drawing up or alteration of specifications, the provision of patterns and the final testing of completed articles, are essentially processes belonging to manufacture and supply. To have the first process of supply outside the department responsible for supply is bound to lead, with the best will in the world, to delays and difficulties.

"The organisation (in the Ministry) should be of such a character that the War Office can rely without question upon its decisions."

No decision had been reached on Monday, November 22. On that day, to my joy, Lloyd George became more insistent than ever, and, although I was fully occupied at the time with conferences with French artillerymen, he instructed me at the end of lunch to return to the office, prepare a statement of the case in its final form, and have it ready for him to take to the Prime Minister at 3.30. I ventured to point out to him that, as it was then 2.45, it was a fairly "tough proposition," although it was the kind of thing that I was used to. The subject, however, was well in my bones, and the necessary document was ready by 3.40. Later in the day it was

¹ My italics.

reported that the Prime Minister supported our view. I do not think that General Von Donop (The Master-General of Ordnance) strengthened his opposition to the proposal by the memorandum he submitted, although the issue was an important one for the artillery expert. There were, however, other difficulties at that time, as we shall see later on, and perhaps they helped us to obtain prompt action.

Whether this was so or not, the transaction was completed by November 27, and the Ministry at last became responsible for the preparation of designs, patterns and specifications, as well as for the testing of arms and ammunition. In other words, it had at last obtained command of all the stages of munition manufacture. The War Office necessarily retained the duties of fixing the requirements of the Army, both as to the nature and amount of the munitions, as well as responsibility for their receipt, custody and distribution. The necessary transfer, or introduction, of skilled officers to staff an Ordnance Department under the Ministry was quickly arranged, and Major-General Sir J. P. Du Cane was recalled from France and made the first Military Adviser of the Ministry and Director-General of Design.

CHAPTER V

EARLY DAYS OF WORK AT THE MINISTRY OF MUNITIONS

Patriotic Firms—Adventurers—Difficulties in providing Working Instructions—Organisation—Stevenson—Roger—Rhondda and Civil Servants—"Business" Government—Glyn West—Alfred Herbert—Leonard Llewelyn—Reasons for Arrears—The Armament Firms—Introduction of Engineering Firms generally—Labour Shortages—Lloyd George and Compulsion—Girouard succeeded by Black.

DURING the early days of the Ministry and before the programme of future requirements had been fully formulated, we knew that we had to secure as rapid an augmentation of output as possible, and it provided us with abundant work. The doing of it also afforded many opportunities for contrasting the very best and the very worst of humanity. It gave us stimulus and some entertainment.

The best needs no exposition. Men eagerly placed their works at our disposal prepared to scrap their machinery, if need be, and to abandon orders at the cost perhaps of the goodwill of a business that might have taken generations to build up. It was the same spirit that had made men of all ranks compete for places in the trenches.

In contrast to these there was gathered together in London at that time a singular collection of sharks and adventurers from all parts of the earth. The strangest thing about their operations was the way in which they induced public men of undoubted good faith to urge us to see them. Their general idea was to get an order and on the strength of it to prevail upon different firms either in this country, America or Canada, on the basis of a liberal commission, to do the work for them; and it cannot be doubted that, throughout the war, a good many of these creatures attained success. I cannot remember one that filtered through to me who had any responsible works at his command. Many of them had such reliable references that we soon began to be heckled in Parliament as to why we were turning down this or that splendid offer. We were offered over and over again a certain five hundred

thousand rifles which belonged to the United States Government and which they had no intention of parting with.

The alert Chief of the Intelligence Department at the War Office supplied me with a list of most of these people, together with a record of their connections and character, and I used to have it handy in a private drawer. One gentleman, who obtained the support of some well-known people in this country for a rifle offer, was a cheesemonger in New York. I was assailed vigorously in the House by a Member—who shall be nameless but who perhaps could be guessed at by a search in Hansard—who was convinced that we were a set of slackers because we persistently turned down an attractive offer of millions of shells from a certain group, well known to us as the Threadneedle Syndicate. This group consisted of a jeweller in Hatton Garden and two colleagues in New York, neither of whom possessed either works or machinery.

Another Member of Parliament, in entire good faith, brought to me an ingenious gentleman from the East of Scotland—a man with a horrible squint, very fat, with a little snub nose and a head that sloped upwards to a point. According to his own account, he had all the capacities of Edinburgh, Leith and the surrounding districts in the hollow of his hand, and we had only to arm him with dictatorial powers and the whole of the engineering trades in the East of Scotland would greet it with acclamation. He was possessed of exceptional self-confidence and verbosity; but unfortunately he claimed to hold a certain post, and I had before me on the table a detailed description of the gentleman who really did hold that post, and who was a person of an entirely different name and quality.

It was not often that these patriots got through even to a Junior Minister. When they did it was, I think without exception, because they were supported by some public man and it had become desirable that they should be seen in his presence and that he should be a witness to the pricking of the bubble.

Putting these bandits on one side, however, the first necessity was to harness up the widespread enthusiasm to get to work. There was no short cut to success and we were conscious all the time of the risk that, during the delays that were inevitable in the sorting out of orders, in the provision of gauges, drawings, samples and so forth, we might lose much of the enthusiasm which had been engendered. It was therefore necessary to link up all these offers of assistance in such a way that they could be made use of as quickly as possible.

Amongst the other chief assistants that were selected during those first few days was Sir James Stevenson, Bart.,¹ a Director of

¹ Now Lord Stevenson.



SIR F. W. BENSON, K.C.B.

the firm of Johnny Walker's Whisky. Mr. Stevenson, as he was then, knew no more about lathes and master-gauges than I did, but for all that he was the right man to put in charge of what we called "Area Organisation," and I selected him for that post.

It is common knowledge now that the scheme of District Organisation we planned in those days, with much help from Beveridge and Mr. C. F. Rey in the Labour Department, was a conspicuous success; and the best people all over the country, from municipal authorities, large firms, public companies and elsewhere, gladly helped us to make it so. But Stevenson deserves a substantial measure of the credit.

His appointment was similar to that of many more. He had the type of mind that saw the problem whole and yet did not lose sight of essential detail. I suppose that if the *Globe* newspaper, which at that time led an active campaign against my own appointment because I did not happen to be a "business" man, had only heard that I had appointed a Cambridge Don to be the head of a very highly technical Statistical Department, a financial man like Sir Alexander Roger to take charge of the production of bombs, grenades and trench warfare supplies, and a Director of a whisky firm to organise production of an engineering character, its criticism would have been even more pungent than it was. If Stevenson had turned his mind to packing sardines or to making watches I should think he would have met with as much success, although he might never have been a fisherman or a jeweller's apprentice. Similarly, the criticism directed against myself would have had no point if I had been trained, say, as a mechanic or had been successful as a vendor of tea, for then I should have been a "business" man.

It may perhaps be interesting to those who were continually clamouring at one time for a "Business Government" to know that the big business men about us were often more insistent on the Layton type of appointment than anyone else. I remember that Lord Rhondda, before we sent him to America to take up the execution of our contracts there, came to me and said that he wanted a Civil Servant to go with him. I suggested that as his errand was essentially a business one he might possibly prefer a man with a business training. But he would have none of it. He said, "No. I want a first-rate Civil Servant. I don't care if he has never been inside an engineering works or made a contract in his life. He must be a wide-minded, alert, educated fellow of good address, capable of dealing with people and able to get up any subject that comes along." He asked me to select two men for him to choose from. I put, as my first selection, Mr. R. H. Carr, C.B., whom I had

known at the Board of Education, and Rhondda decided to take him. The worst of it was that, although afterwards we got Carr back for a time to help us in the Establishment Division at the Ministry, Rhondda insisted on taking him as one of his right-hand men when he went to the Ministry of Food. The incident was nothing unusual, but it may provide material for reflection to those who penned the attacks in the *Globe* newspaper— if such people ever do reflect on anything except on how to create a sensation.

The War Office Munitions Committees that had been set up under Booth's direction provided for us a useful initial contribution ; he had got together a number of men who had made substantial progress in different districts. In particular Lord Elphinstone had mobilised contributions in the Midlands, and Mr. W. T. MacLellan had made a valuable start in making good some of the deficiencies in fuse orders.

The first thing to do was to find out exactly why deliveries of shells and of their component parts were so tragically behind promises, and why, in addition, the issue of complete rounds of ammunition to the troops was so much behind the deliveries of empty shells.

At the suggestion of Girouard we obtained the services of Sir Glyn West, who was in charge of ammunition manufacture in all its branches for Messrs. Armstrong, Whitworth & Co. If Girouard had never rendered us any other service than to bring in Glyn West he would have served us well. Linked up with West's department we had the assistance of Sir Alfred Herbert for the supply of machine tools, and the late Sir Leonard Llewelyn for the supply of materials.

The examination of the arrears position revealed that there were many directions in which the causes for them could not fairly be laid to the charge of the individual firms supplying the parts. It was found, for instance, that in some places machines had been delivered but could not be set up owing to a lack of skilled labour, and in others the machines had been set up but there were shortages of materials. West and Herbert showed that there were some 16,000 small lathes, mostly suitable for work that was required to make up arrears, but which were not engaged on government work at all, and there were 12,500 suitable large lathes that were not making any contribution.

Where there were machinery and men it was obviously necessary to get the material to them, and where there were men and material, suitable machines that were standing idle should be supplied if possible. The result was that the tyrannical process



PROF. C. L. BUDD



PROF. E. W. HARKORD

of "control" began and we took command of materials and of all the machine tools in the country. Steel billets or forgings, brass strip, copper for bands, and so on, were taken from one man's works and moved to another's. One firm was turned on to do a part of another's work, machinery was taken from one works and moved to another in an orderly but bewildering hustle. It had to be done. It was the only way of picking up arrears, especially for those components that were the shortest. But this wholesale modification of existing arrangements meant that we were laying up stores of trouble for ourselves in finance, in stores accounts and in keeping track of all the changes. The process began very quickly, for by June 3 the Birmingham Corporation had undertaken to complete 13,000 4.5" shell cases and 1,000 18-pounder shells per week that were taken from different works, and arrangements were in process with many others to make good arrears or deficiencies for existing contractors.

Whilst, however, many of the causes of arrears were beyond the control of the firms themselves, many were not. It transpired, for example, that of the smaller lathes, already engaged on government work, only 20 per cent. were working at night, and only 30 per cent. of the larger ones; nor could a lack of labour always be pleaded as an excuse. When we had made all the most generous allowances that we could, the conclusion was inevitable that if a statement of the arrears of some of the great armament firms had been published, and the grotesque disproportion between their undertakings and their performances revealed, their reputations would have been destroyed for ever. Admittedly they did their best, but they had no right to take immense orders which it was impossible for them to execute. It had misled the War Office and brought the country into unnecessary danger. Their plan was to parcel out to sub-contracting firms work that could not be done in their own shops, and there was also a patriotic zeal to undertake big tasks. But candour compels one to say that it was impossible to escape the impression that there were elements of greed about it and a desire to keep other people out of the business.

I afterwards discovered that our own experience of the large munition firms, on which it had been the custom to rely, had been repeated in France. M. Albert Thomas, who was then the French Minister of Munitions and had greatly increased munition production throughout France, told me on July 7 that they similarly had found the big contractors in arrears, through their having taken on vastly greater orders than they could execute. It had only been by organising the small producers that the French had been able to supply themselves. It was a fine tribute to progress in

France that, on my explaining that a shortage of fuses was preventing the completion of a large amount of our ammunition, he offered there and then to supply us with 10,000 fuses a day filled and complete. It should be remembered also that this offer was made when the French themselves were using vast quantities of ammunition and when the richest part of their industrial district was in the occupation of the Germans.

But it would not be fair to blame the firms too much for the perilous position into which we had drifted. The officers at the War Office and everyone else had been accustomed to regard munition manufacture as the speciality of certain firms, and all people are prone to overestimate the technical requirements and degree of experience required for the exercise of their craft. It is easy also to be wise after the event. Even Girouard had great difficulty in overcoming his prejudices when we insisted on trying to mobilise all sorts of works to do difficult and intricate work. For my part I never could see why firms which could make sewing machines, bicycles, or typewriters, could not very soon make the essential parts of fuses or machine-guns; or why the jewellers of Hatton Garden could not make gauges. The only possible way to meet the situation was to throw the door wide open, and the evidence was overwhelming that if we did so success would be achieved. There was a stiff battle on this issue, but it was soon over, although there were hundreds of difficulties to be overcome. Everybody was keen to learn and to help one another and it would be ungracious to refrain from acknowledging the complete readiness with which the large armament firms lent their experts to give assistance to new makers when we asked them to do so.

Glyn West soon obtained the assistance of such men as Sir H. Fowler and Mr. C. H. Stevens, who had specialised in workshop production, and some of their reports were encouraging reading. But if any justification for the wider policy had been wanted it was supplied in abundance by go-ahead firms who adopted up-to-date methods in their manufacturing processes. Many of these firms had never made any part of a munition, but they soon rendered time-rates for the different processes that beat even the records of the more experienced munition firms.

The investigation of the causes of the discrepancies between the numbers of the deliveries of shell parts and the issue of completed ammunition raised different, and, if possible, more difficult questions. The delivery in corresponding numbers at the same time of the different components was unfortunately most defective, and it took a long time before the deficiencies could be made good.

Layton's department revealed many of them, of which, as a single illustration, it may be mentioned that with an order for 3,000 guns, only 1,000 of the vital dial sights were due for delivery at the same time as the guns.

The ammunition requirements of the guns in the field during July were 367,000 per week, but the issues of ammunition averaged only 149,000, and this was mostly made up of shrapnel. The requirements of 18-pounder high-explosive ammunition averaged 117,000 per week. But only 44,000 empty shell cases per week had been delivered, and the weekly average of *complete* rounds was only 8,500. At one time this was due to a lack of filled fuses ; at another time to a shortage of the part called the primer, and so forth. It became necessary therefore to systematise the output and timing of deliveries of components and to provide a greatly increased filling and assembling capacity. It had been recognised before the formation of the Ministry that the resources of Woolwich would be insufficient for the filling work, and the War Office had made some provision for additional filling plant by commencing to erect new factories. The work on these factories was accelerated and fifteen new ones were provided, with large munition stores in different parts of the country. But it was many months before all the processes had been harmonised.

No advantage is to be gained by probing too closely into the causes of all these discrepancies, especially by one who is as conscious as I am of all the difficulties and inevitable errors that were attendant upon the business. The general cause was that too great a reliance had been placed upon the capacities of a few firms.

The character and complexity of the task also, on this new and unprecedented scale, had not been visualised, and the work was attempted to be done with an utterly inadequate organisation. Moreover, in the first enthusiasm great numbers of highly skilled men had joined the colours ; and without their aid it was certain that the production of many parts such as machines, gauges, sighting apparatus, scientific instruments and many portions of guns, rifles and machine-guns would be dangerously delayed.

It was in connection with this last-mentioned point that Lord Derby first came into touch with us. On Saturday, June 5, he had a conference with Lloyd George and myself, and took over to Lord French the outline of a proposal for the ascertainment and weeding-out of certain classes of skilled men. At the same time he was the bearer of a suggestion for the salvage of used cartridge cases and so marked the beginning of one of the best-managed pieces of work that was done by the Army in France. The Army

Salvage Department proved thereafter to be one of our most efficient and friendly allies.

Unfortunately, Lloyd George had come back from his Lancashire visit rather infected with the idea that proposals for labour conscription were required. During the first week of the Ministry's existence we had had a deputation from the Clyde which pressed this upon us, and there were always a number of people from that district who were enthusiastic in the recommendation of that policy. Whilst faults can freely be attributed to both sides, and to the Ministry with the rest, I was often disposed to think that the spirit which in those early days prompted this suggestion had a substantial share of the responsibility for the grave labour troubles that we continually had in the Clyde district.

Lloyd George let himself go rather in his speech at Manchester and there was something of a storm about it in the House of Commons on Monday, June 7. On the previous Saturday I had entered a vehement protest against the proposal; and Lord Reading, who came in towards the end of the interview, was also a critic. The case against compulsion was that, whilst there was undoubtedly slacking and short time in some quarters, it was certain that, even in a time of danger, the people would not tolerate a proposal that involved forced labour unless an overwhelming case could be made in favour of it. No such case could be made out, for the deputations with which we were daily being bombarded showed that important and responsible manufacturers had been offering to do work for weeks or months without any result, and that we were far from making a full use of the existing resources of men and machinery. Moreover, they could not be effectively used until efficient local agencies competent to mobilise them for us had been created. Whatever, therefore, might happen in the future, we were, and for a long time to come would be, besieged with efficient volunteers confronted by a scarcity of those precise instructions, samples and gauges that were necessary for the commencement of work. On this last-mentioned account alone, the case would have utterly broken down if it came to be debated in the House of Commons. Moreover, it was hopeless to talk about administering any scheme of compulsion from a centralised department, although, admittedly, some means would have to be devised for making vital skilled workers available where they were wanted.

Lloyd George took all this vehemence with the utmost goodwill, for in those days he had not developed that autocratic temper which, later on, made him resent the outspoken criticism of his best friends and prompted him to lend too ready an ear to the comforting words

of flatterers. There was no difficulty in preparing the evidence he asked for in support of my view of the case, and within a month the work of the Munitions Committees both in England and Scotland had knocked the bottom out of the suggestion.

Many people, however, both then and afterwards, were convinced that some scheme for the compulsory labour conscription of the whole nation was the right way of dealing with our difficulties. I never met one of them who had the vaguest idea as to how he would work the scheme even if Parliament had adopted it. The egregious fiasco, nearly two years later, that attended the efforts of the Man-Power Board who aspired to direct the economical and proper employment of workpeople in every workshop in the land through a Government office, should provide a lesson for those who still have a lingering affection for this specific.

It is tempting to pursue this subject further, but in a general chapter it is impossible to do any sort of justice to the great issues affecting labour with which we had to deal. They were difficult beyond expression and it was impossible, in the nature of the case, to adjust things so as to satisfy all parties. The problems were continually changing their form as the demands for man-power developed, but they were always urgent and clamouring at the door. They must be treated separately with other developments that had their beginnings in the early days of the Ministry's work.

The men who devised and worked our different schemes come into their own sections of the story—difficult and invidious as it must sometimes be to mention names. A man with ministerial office is apt to think too much in terms of those who, owing to their position, have special access to himself, and he may fail to mention, or even to seem to recognise, many others whose merit may have been equally great, but whose work did not happen to bring them into personal contact with himself.

With reference to men, however, it should be recorded at this place that Sir Percy Girouard left the services of the Ministry towards the end of July, and Sir Frederick Black was obtained from the Admiralty as General Director of the Supply Department. Neither Lloyd George, Montagu nor myself, who were successively Ministers, ever regretted Black's appointment; his quiet tact, wide knowledge and mature experience were devoted wholeheartedly to the development of the new production policy, and he was trusted and respected by all of us.

Girouard had never fitted comfortably into the new régime. Apart from the creation of a certain number of special government factories, I think that he always distrusted the policy we were so determinedly pursuing of bringing all kinds of works and workers

wholesale into munitions production. Moreover, he was never able to adjust himself to Lloyd George's methods and point of view, so that it was inevitable that they should part company.

These pages have more than once testified to the services rendered by Girouard during his period of work at the War Office and at the Ministry. If I were to select the one that seemed to me to be the greatest, it was that he, in conjunction with Booth, had laid hands on a few men who afterwards proved able to render service of exceptional value.

CHAPTER VI

THE FIRST PROGRAMME AND SOME ITEMS OF PROGRESS

Former incomplete Programmes—Kitchener and Staff at the War Office—Guns—
The Dispute over Heavy Guns—Work of Lloyd George—German and Allied
Supplies—Later Records of Supply—Machine-guns—Work of Moir—Rifles
—Work of Geddes.

I HAVE already said that at one of our earliest conferences Lloyd George undertook to deal with the question of programme. We felt sure that it would involve questions of policy which would call for the exercise of all the power he had in the Cabinet to obtain the necessary decisions. As a preliminary he visited France during June and conferred with French, and discussed artillery questions with our Allies in Paris. The result was that during July we were provided with a programme of gun and gun ammunition requirements that formed the first clear statement of the task before us.

Before that time the formulation of requirements must have been rather a sketchy and hand-to-mouth business; how, otherwise, was it possible to account for the disparities amongst the orders for the ingredients of complete rounds of ammunition? How, otherwise, could we account for the fact that, whilst a statement of machine-gun requirements was already available, little more than half the requirements had been covered even by orders of the most provisional kind, apart from any allowance for the high percentage of waste? The same considerations applied to the case of the heavy guns. It is perfectly true that, as the war developed, the big gun came to be used more and more, but the need for a great many of them had become manifest long before June, 1915. There were forty-eight 6" howitzers in the field and 102 more were on order, but French's requirement forecasted a need of 640. Of 8" howitzers, twenty-three had been delivered, and nine others were on order, but French asked for 227.

Collateral evidence of the justice of this criticism was furnished on June 7 when I had an interview with Mr. Grenfell and Mr. Wigham (the representatives of our agents in America, Messrs. J. P. Morgan).

They reported that they had been informed some time previously by the War Office that additional orders for explosives were not called for. But the consumption of explosives in big-gun ammunition was enormous and altogether beyond the supplies that had been arranged for, and, unfortunately, we were obliged to look to America for a large proportion of the ingredients of our propellant explosives. Therefore the statement that there was no necessity for additional orders could not have been made if the consumption of explosives by big guns had been worked out.

The explanation of these things was that an efficient General Staff had not been created at the War Office. Many of the best men on the Staff had gone to France at the beginning of the war, and a responsible Staff had not been recreated. There were plenty of able men at the War Office, but they were not functioning as a General Staff. This weakness dominated everything during the latter half of 1915, and it was not until Field-Marshal Sir William Robertson came back from France in December to become Chief of the General Staff, that fully responsible Staff organisation came into existence again at the War Office.

Nothing is to be gained by probing this matter any further. Although in some things we had to begin practically at the beginning there were plenty of willing and capable helpers to assist us in working out a supply programme in all its details.

Some general considerations were obvious from the first—

(1) Whatever the programme was, a substantial margin of extra capacity would have to be provided to meet future increases.

(2) There were many demands which had not yet reached the programme stage; but which, when they came, would involve extensive demands upon materials, machinery, and manufacturing capacity. Amongst these the needs for Trench Warfare and Transport Supplies were already prominent.

(3) We must make allowances for submarine losses on overseas supplies, and

(4) We must plan the development of our productive capacity so as to enable us to help our Allies—especially the Russians, whose engineering resources were so limited.

GUNS

Special considerations applied to the case of guns.

(1) We had to make good the deficiency in the divisional equipment of artillery on the gun establishment already stated to be required.

(2) Headquarters would certainly ask for an increase on the existing gun establishment, and we were told that a large increase

of the heavier artillery for general army purposes would be demanded.

(3) In due time also there would be a big demand for anti-aircraft guns, and a large workshop capacity would have to be made available for repair work.

(4) The Russians were particularly in need of artillery and, at our earliest conferences, we had agreed with the French that we must do everything possible to help them.

The July programme came in. It called for a great increase of all existing types of guns except the 18-pounder and it set out the artillery we ought to provide for the Army by the summer of 1916.

The relation of the programme to the position as it was on June 1, 1915, is best shown in tabular form; the first column showing the guns that had been delivered up to June 1, the second those that were on order but had not been delivered, and the third required for French's first programme.

Guns.	Delivered.	On order.	The Programme.
4·5" howitzer	126	837	1,600
60-pounder	42	137	800
6" howitzer	Nil	102	640
8" "	23	9	227
9·2" "	16	32	199
12" "	5	27	56

The production of heavy guns thus forecasted represented a prodigious undertaking, not only in the terms of the guns themselves, but in all it would mean in the manufacture and supply of the ammunition they would use. Nevertheless, it was decided to place orders in excess of French's programme, and again I am afraid I must inflict a small table upon the reader, showing, in the first column, the number of guns that we must supply beyond those already ordered so as to meet French's requirements, and in the second column the number we actually ordered.

Guns.	Additional orders required.	Ordered by Ministry.
4·5" howitzer	637	937
60-pounder	621	741
6" howitzer	538	878
8" "	195	530
9·2" "	151	330
12" "	24	53

The extra order of the 4·5" howitzers is mainly accounted for by what we had agreed to supply to the Russians, but the huge additional orders for the heavier types represented a bold advance beyond the War Office programme.

The proposals of the Ministry provoked acute controversy and

Lloyd George had to fight hard for them in the Cabinet Committee. The whole feeling of the men in France, however, so far as could be ascertained, as well as of the French artillerymen, supported this great extension of the big-gun programme because every month that passed dictated the necessity for a greater proportion of heavy guns as soon as sufficient artillerymen could be trained to use them and shells became available.

I myself only caught echoes of the discussions from Lloyd George himself or from other Ministers who used to drop in to ask about the various points. Curzon and Churchill gave us hearty support, but McKenna, as Chancellor of the Exchequer, was critical.

When the ammunition equivalents of the increased number of big guns came to be worked out in terms of steel, explosives, workshop capacity and otherwise, they represented an undertaking far beyond the mere manufacture of the guns themselves. So vast it was that McKenna more than once asked me—"How much is it all going to cost, and how is it going to be paid for?"

The only reply I could make was that we had a number of able men working out the costs and we would give an estimate as soon as possible. The cost would certainly be enormous although our best men were already telling me that we ought to secure big reductions on current prices. I could only emphasise the fact that my duty was to try and help to get the things provided, and that if the Cabinet and the other great people said they were required it was their business to make arrangements for paying for them, although we must do everything we could to keep costs down.

It has always been my view that the stand taken by Lloyd George in July, 1915, for the big-gun programme was his most important contribution to the war. He cannot be credited with half the things that Press campaigns, unprecedented in their lavish adulation, attributed to him. Some of the exploits were imaginary and some were due to others, and the Press campaign, in his case, as in that of Kitchener, was harmful in the long run. But in this instance, although he was prompted by other men, his own imagination and energy were largely responsible for forcing through the invaluable gun programme of July, 1915, and he deserves great credit for it.

How invaluable this bold adventure was, we none of us knew at that time, but repetition will be avoided and the proportions of the case will be seen in better perspective if I refer at once to some of the demands that arose later on and which provided a far ampler justification of the production planned in July, 1915, than any of us could have anticipated.

The repair and relining programme of guns came to represent a workshop undertaking equivalent in itself to the monthly output

that was originally contemplated. When the submarine campaign developed in the autumn of 1916 and in the spring of 1917 we were called upon to provide many hundreds of guns for arming merchant ships, and the anti-aircraft work made drafts upon our workshop capacity which could not have been foreseen in July, 1915. It was only the bold initial decision to allow a big margin for the unforeseen in the development of workshop capacity that enabled us to meet these calls upon us.

Apart from these the later artillery developments of the war on land were the completest justification of all. The gun programme was soon revised and enlarged, but in May, 1917, it provided the final justification for the initial excess in big-gun manufacture. We had become used to shocks by then, but I confess that the programme of May, 1917, with all the concomitant hazards and difficulties of the submarine campaign and the growth of other demands, provided one of the worst shocks that we had experienced. But the demands were subsequently met, and more.¹

Altogether apart from what we had supplied to our Allies, the demands of the British Expeditionary Force in France for the heaviest guns became nearly twice as great as the supplies planned in July, 1915, even when the Ministry's additions had been taken account of.

The first column in the accompanying Table shows the numbers of guns that the Ministry itself had supplied to our own and Allied Armies up to March, 1917, and the second column shows the output required for the British Army alone, as forecasted in May, 1917—

Guns.	Already supplied.	Requirement.
4·5" howitzer	1,482	1,671
60-pounder	850	1,799
6" howitzer	970	2,136
8" "	317	879
9·2" "	226	

This is rather a long look forward, but it is material to the acute controversy which arose over the Ministry's gun programme in July, 1917.

The first thing to do was to collect a group of men who would be responsible for organising the country's gun production, and we enlisted the services of Sir Charles Ellis, K.C.B., of Messrs. John Brown & Co., to take general charge, and he had Colonel W. C. Symon from the War Office as his Chief Assistant. I never knew Symon nonplussed or flurried. His knowledge was immense, and

¹ The numbers of some types, as well as the ultimate output, are purposely omitted.

it was combined all the time with a clear grasp of what was involved in machinery and workshop capacity.

GUN AMMUNITION

In July, 1915, our own production of ammunition was just beginning to exceed 150,000 per *week*. So far as our information was to be relied upon the conjoined German and Austrian output at that time was about 250,000 rounds per *day*. The Russians for the whole of their extended line were not producing more than we were. It was therefore fortunate for the world that the French (thanks to their early adoption of co-operative production) had attained a fine output, although it was far behind that of our enemies.

It was not difficult to forecast ammunition requirements. They were consequential upon the number of guns. We knew that only half the desired number of divisions were supplied with guns, and that existing guns were only about half supplied with ammunition, and their reserves were trifling. We had to allow also for the manufacture of a large proportion of the ammunition for the guns supplied to the Russians. At that time the number of rounds asked for for each of the heavy guns per day was very small, but we were told that as soon as there was any likelihood of our being able to supply them, a much greater number would be required. We did not know what this would amount to, but Glyn West and his colleagues were instructed to provide a very liberal margin. They were indeed charged to develop the country's capacity to the utmost. A useful guide to subsequent parts of the story, and illustrative of the development of war experience, will be supplied by a table, showing the number of shells to be made for each gun per day, and it will be sufficient to contrast August, 1915, with August, 1916—

NUMBER OF SHELLS REQUIRED PER GUN PER DAY

Type.	August, 1915.	August, 1916
18-pounder	17 ..	25
4.5 howitzer	17 ..	25
60-pounder	17 ..	20
6" howitzer	5 ..	25
8" "	5 ..	25
9.2" "	5 ..	25

After West, Llewelyn, Herbert and the men from the Explosives Department had examined the ammunition demand and resolved it into terms of labour, material and machinery required, we were advised that we might reach an output of filled ammunition of 600,000 per week by March, 1916, and that afterwards it would increase very rapidly. As a matter of fact, 645,000 was the figure



1871-1944
SIR CHARLES F. S. K. B.



1871-1944
SIR ERNEST W. MOOR, Bt.

reached in the first week of May, 1916, and during the December of that year, for special reasons which will be referred to later, the output of filled ammunition exceeded 2,000,000 a week.

MACHINE-GUNS

The machine-gun programme, like that of rifles, was difficult because of the drafts it made upon our supplies of skilled labour and of special machinery. Sir Ernest Moir, Bart., who had already been responsible for the report on Ammunition Production in France, undertook the charge of machine-gun production, and by September, 1915, he had made arrangements to provide for an ultimate delivery of 32,000 guns per annum. This figure was designed to cover the 13,000 requirement twice over during a year owing to the six months' life of a machine-gun, and to leave a margin for future increases.

It is common knowledge that as soon as they became available machine-guns were much more used by the Armies, and in the summer of 1916 the established numbers were increased by some 50 per cent. By that time also the demands for them for aeroplanes and tanks had become considerable. The arrangements, however, which Moir designed, proved to be fully sufficient, and from 1916 onwards they kept pace with the demand, whatever it was.

RIFLES

The task before Geddes in increasing the production of rifles was really threefold. He had to provide for an increased production from our excellent home factories. Next, by gradually mobilising firms adapted to this class of work—such as the makers of bicycles, typewriting machines, sewing machines and others—he sought to promote the separate manufacture of rifle parts and make arrangements for their assembly and fitting together. And, finally, it was necessary to give all the skilled help we could to those who had been entrusted with rifle orders in America and Canada.

It was a long time before the American and Canadian supplies began to come forward in substantial numbers, and there were many difficulties even then. The scheme of piecemeal production also did not begin to yield material results until the latter half of 1916. We were told by the experts at the first—and they were right—that from beginning rifle manufacture to obtaining substantial supplies, at least a year, and possibly eighteen months, would be involved. Nevertheless, by the summer of 1916 all anxieties as to rifle supply had been removed, and it was mainly owing to two circumstances: first, that the output of our own home factories had increased in the most gratifying way, and, second—

and perhaps even more important still—the wastage of rifles had been much less than was anticipated ; indeed it was reduced to surprisingly small dimensions by the excellent repair arrangements at the front and at home.

One other ingredient of the scheme of work which the July programme of 1915 called for was the institution of a separate branch to supply all optical and scientific instruments, range-finders, gun-sights, telescopes and binoculars that were essential concomitants of the programme. Mr. Cheshire from the Patent Office, and Mr. A. S. Esselmont, were made responsible for these supplies, and they were linked up with the rifle section under Geddes.

The foregoing summary of the programme of July, 1915, has been deliberately confined to certain groups of munitions, and its vast corollary in materials, machinery and labour has scarcely been hinted at. Where we were using steel by the thousand tons we should want it by the ten thousand ; where we were using explosives by the hundred tons we should want them by the thousand tons, and many ingredients must be shipped in enormous quantities from distant places. By whatever paths they came, however, and through whatever processes of manufacture they might have to pass, the ultimate end was something wanted by the Armies in the field. Before long these and other demands affected every department of our national life.

CHAPTER VII

PRICES

What would the Programme Cost?—Disparity in Tender Prices—National Factories—Need for a Costing System—John Mann—Discovery of Hardman Lever—The System Established—Lever's Instructions—The Five Great Firms—Great Reductions in Cost—Results of the Costing System—Sulphuric Acid Costs and Foreign Competition—Results in the National Factories—State Contracts—House of Commons and Costs—The Public Accounts Committee—How the Public have been Misled—Value of Experts.

THE July programme represented a prodigious manufacturing proposition which, if the war continued, would be increased in many directions. As it came to be worked out in detail and as its real proportions emerged, not only had we to ask ourselves how we were to get it executed and how the materials, men and machinery were to be got together, but what would it all cost?

The system of competitive tender was out of the question because we wanted practically all that everybody could produce, and repeated inquiries from those who had hitherto had the responsibility for fixing contract prices made it apparent that there had in reality been no basis for negotiation save old-time prices applicable to a small output and which themselves rested upon no basis of ascertained fact.

It seemed an extraordinary thing that for all these years the Treasury should have consented to contracts being made by Departments without insisting on the creation of efficient machinery for ascertaining that the prices paid were not more than was reasonable having regard to the cost of manufacture.

In bargaining as to prices we ought surely to have some knowledge as to what things cost to make, but whenever the matter was discussed with the representatives of the leading firms no guidance was forthcoming. Instead we were met with long discourses upon the charges which ought to be taken into account and the assumption seemed to be that the terms of the existing contracts were uncommonly favourable to us.

As time went on I became more and more sceptical about all this, and determined that we would find out for ourselves, as the Cost

Accountants reported that it was perfectly easy to do so. Nobody wished to deprive the armament firms, or anyone else, of a fair profit, but it was obvious that some more scientific method for determining prices was necessary. Indications of this necessity did not come singly—they came in shoals. Prices suggested by private manufacturers, or by the new Boards of Management, differed widely from those which had hitherto been paid. As we were embarking upon an expenditure which would total hundreds of millions, I sought and obtained Lloyd George's permission to give instructions that, pending further information, prices were to be provisional, particularly for the larger contracts.

Two illustrations out of a multitude may suffice to indicate the grounds for this course of action—

One was that in the second week in June, the Materials Department reported that spelter for galvanising purposes was being held up. We therefore let it be known that the difficulties of obtaining supplies would probably necessitate the early control of spelter. Prices promptly dropped substantially, and merchants who had previously told us they had not an ounce to spare were within a week offering it freely.

The second concerned a well-known armament firm whose quotation for a gun wagon was £220, and for the limber £215, whilst a private manufacturing company, experienced in this class of work, was prepared to supply the wagon for £116, and the limber for £111. Moreover it appeared that the latter firm had been acting as sub-contractor to the former, and it would have been interesting to know how much had been pocketed in the process.

Gulland, the Chief Whip, who knew of our need for men who could help in the creation of a costing system, introduced to me Mr. John Mann¹ of Glasgow, and I interviewed him on June 17. Our conversation convinced me that what I had in mind was quite possible, and I invited him to join the Ministry.

There were at this time many gatherings of the chief Heads of Departments, with specialists added according to the subjects under discussion, and Lloyd George instituted the very useful practice of having regular weekly sittings. During July we had long meetings to consider the new big-gun and shell programme, and a little incident occurred at one of them which had important after-consequences.

A part of the scheme which Girouard and others had proposed was the creation of a number of national ammunition factories, to be managed by existing firms on the basis of a commission. The arrangements did not seem to me likely to give us that real command of the items of cost which we ought to have. The meeting at which

¹ Sir John Mann, K.B.E.

the subject was considered was attended by a number of men from the Finance and Contracts Branches whom I had not seen before. I expressed with emphasis my misgivings as to the adequacy of the arrangements proposed and contended that nothing could be satisfactory that did not rest upon a sufficient knowledge of the actual costs of manufacture and of the proper allowances for other charges. If more than a fair profit were paid, a needless expenditure of many millions would be involved on our enormous programme. I noticed sympathetic responses in the faces of many of those present beside Geddes and John Mann, who had previously supported the proposal. Amongst these was a short, broad man, with a high forehead, keen eyes and a determined mouth who had come in with the finance people and was sitting at the back. He had not said a word during the discussion, but apparently agreed that the proposed commission system was far from satisfactory.

I drew Lloyd George's attention to this man, and expressed my intention of having a talk to him. After the meeting I found that he was Mr. Hardman Lever,¹ who had been introduced by Booth, and, in conversation with him, Geddes and Mann, I was enthusiastically encouraged to press on with the establishment of an efficient costing system. The outcome of this was that, after many conferences, I recommended Lloyd George, in the second week in August, to appoint Lever to have charge of the creation of a scheme for ascertaining cost in the new munition factories and for revising present tenders on a fair basis. Lloyd George agreed with the suggestion, and made me responsible for carrying it out. The scheme had the hearty co-operation of the local Boards of Management and the duty assigned to Lever in this connection was in the following terms—

"The institution and installation, wherever possible, of systems of cost-accounting in H.M. Government Munition Factories under the control of this Department, in order that detailed particulars as to the cost of the various munitions produced in such factories may be ascertained and returns made to the various heads of departments to whom such information may be of use."

The costing system which developed out of this first endeavour was subsequently applied under the direction of Mr. Webster Jenkinson to all the different national factories for the manufacture of ammunition and for many other purposes.

Lever and his associates could not have done their work had they not been heartily supported by Sir Philip Hanson and his colleagues in the Contracts Branch, and by the different men in charge of the supplies. Their task was a difficult one and involved innumer-

¹ Sir Hardman Lever, K.C.B.

able enquiries into existing tenders, the drafting of suitable forms of contract for the future and the creation of a scheme of operations which, from the raw material to the finished article, would give us the necessary information without unfairly harassing contractors or delaying production. With the assistance of John Mann, Sir S. Dannreuther in Accounts, Hanson and others in Contracts, they made remarkably rapid progress. The business men whom we had engaged, such as Ellis in charge of gun production, West for gun ammunition, Stevenson for district work, Roger for trench warfare and many more, gave them that support which alone could make the thing workable.

At the same time West started arrangements for ascertaining the engineering costs in all branches of gun ammunition production and thereby provided an invaluable ally to the Finance Branch of the Ministry. This work was under the charge of Captain O'Brien, and West's Chief Assistants (Sir Henry Fowler, Mr. C. H. Stevens, and Mr. J. B. Maclean), made it their business to see that O'Brien's men had whatever facilities they required. The assistance of the men working on materials supplies with Llewelyn was vital to success, and we invoked the aid of Sir Cecil Budd from the Metal Exchange, of Sir Charles Fielding from the Rio Tinto Corporation, of Mr. W. R. Lysaght and many more. What these men did not know about the different branches of the Metals Trade was not worth knowing, and many and ingenious were the shifts and devices by which they helped to defeat to some extent the rapacity of some of the metal corporations.

Moulton, I am afraid, did not at first take kindly to these new inquisitorial methods, for there came to be a chief costing expert in each supply branch whose business it was to work as Lever's representative. The Explosives Department had had a good start of the rest, and Moulton had collected a wonderful band of men. But as the result will show, there was abundant room for this class of work, even in that highly efficient and ably-staffed department. Sir Philip Henriques was Lever's representative there and he had no more enthusiastic colleagues than Sir Keith Price and Sir Sothorn Holland, who were in charge of high-explosive supplies of all kinds, or of Sir Frederick Nathan, who was responsible for the supply of propellants. The best efforts of these men, however, would not have sufficed had it not been for the help we received on all matters relating to the costs of chemicals and explosives from that amiable giant, Mr. K. B. Quinan, Chief Engineer of De Beers Company, who had become Chief Engineer in the Explosives Department. Full of knowledge and enthusiasm and with physical and intellectual efficiency written all over him, he was a master of scientific manufac-



SIR S. HAYDON LEECH, K.C.B.



SIR J. J. MASS.



SIR S. DASSALETCHIK, K.C.B.



SIR PHILIP HANSON, K.C.B.

ture and had, I am afraid, a good deal of contempt for some of our British methods. All of us who knew him well, loved and admired him. He would have no honours or rewards, and the last time I saw him was one day shortly after the end of the war, when he burst into my room to say good-bye, full of joy because he was going lion-shooting. Later he wrote from the wilds of Central Africa saying that he was having the time of his life ; that the price of sulphuric acid per ton troubled him no more, nor the waste of sulphur in the ash, and that " on-costs " and " establishment charges " belonged to the jargon of people who had saddled themselves with the unnecessary encumbrances of civilisation.

During the weeks following our decision to apply the costing system, the work assumed such enormous importance from the point of view of savings that it became necessary to make quite a new departure in the financial control of a government supply department. In the month of October, with Lloyd George's approval, I therefore appointed Lever as Assistant Financial Secretary, and equipped him with very wide powers. In view of what followed, it is worth while quoting the actual terms of the letter of October 29—

" Mr. Lever,—The work of certain departments of the Ministry dealing more particularly with finance and accounts has grown so rapidly and in so many new directions that it has become necessary to concentrate and co-ordinate these departments. I have, therefore, decided, with Mr. Lloyd George's approval, to appoint an Assistant Financial Secretary, who will be of the same status as the Directors-General, and to whom the Departments of Munitions Finance and Munitions Accounts will be directly responsible. Mr. Lloyd George has approved of your being invited to fill this post.

" With regard to contracts, it will be your duty to see and express your opinion upon all contracts of the following kinds, and you will be responsible for sanctioning their financial terms—

" (1) Contracts which involve capital expenditure or loans.

" (2) Nett cost contracts.

" (3) All important contracts or undertakings involving an expenditure of £40,000 and upwards.

" You may, however, be required by minute of the Minister to extend your functions to contracts other than those specified.

" All such contracts and undertakings must be referred to you, or such officers as you designate for the purpose, before any definite understanding is arrived at with the contractors.

" The Department of Cost Accounting will also continue to be responsible to you.

" As Assistant Financial Secretary, your powers and duties in matters of finance, accounts, and contracts, as above defined, will also extend to the Departments of Explosive Supply and Trench Warfare Supply.

" CHRISTOPHER ADDISON."

Having secured Lever's appointment, our first great objective was the price of gun ammunition, for it was evident that this would transcend that of everything else. The vast weekly output which we had set ourselves to produce would absorb tens of thousands of tons of steel, thousands of tons of explosives and enormous quantities of copper, brass and other materials every week.

We could already see that we should have to work up to a filled ammunition output of a million and a half rounds per week, and possibly more, so that a small reduction on each round would represent a great saving. If, for example, we could reduce the prices of shell cases by a shilling, it meant £50,000 a week for every million supplied, and we had begun to realise that on each of these alone reductions of many shillings ought to be obtainable on each. What applied to shell cases would also apply to cartridge cases, fuses, fillings, explosives and the rest. Experience justified this anticipation; but it will be sufficient to indicate the results obtained if some account is given of what was done with regard to the cost of shell cases.

As the price of manufacture in the new national factories emerged, and as the Boards of Management got to have the business well in hand, we found that both the factory costs and the contracts placed by the Boards of Management showed substantial reductions on the prices then being paid. At that time, for example, the contracts with the largest armament firms for the 18-pounder shell case were from 20s. to 23s. each, but our Boards of Management were placing large contracts at 12s. 6d., and the actual costs at the national factories were coming out at an even lower figure. The well-managed factories of Keithley and Dundee had the premier place at that time, and in January, 1916, the total costs in them, with full allowance for sinking-fund and all other appropriate charges, were found to be 9s. 1d. It was of course perfectly fair that a substantial figure should be added to this amount as the direction of these places, on a voluntary basis, was in the hands of some of the most experienced business men in the locality, and 12s. 6d. was fixed by the Ministry as being a fair figure at that time.

A healthy rivalry sprang up amongst the different national factories, for we took care to circulate tables showing the results in each, and arrangements were made to pass on any valuable suggestion from one to another. Keithley, Dundee and Huddersfield factories somehow or another always managed to be in front, although Liverpool, Swansea, Wrexham, and Carlisle were often close competitors.

Following these indications, our obvious course was to deal with the great private firms, and, during December, 1915, notices were

given to terminate the running shell contracts, with the intimation that prices were to be reconsidered. During that month negotiations were pursued without nearing an agreement, and the best that can be said is that the Directors of these firms were difficult. In some respects their contention that many of their charges were necessarily higher than those of other firms had a measure of justice, and we were prepared to take them into consideration, but we did not fail to point out that the very generous prices hitherto paid must have provided substantial compensation. One large firm declined to discuss reductions at all, but the rest admitted that some reduction was possible. On the advice therefore of Lever and Mann it was decided towards the end of January that the matter should be dealt with by Ministers, and Lloyd George authorised me to interview representatives of the chief firms with our officers and to deal with the matter.

We had two interviews, one on January 31, and one on February 3, and it is to be noted that we were then seeking power under the Munitions of War Amendment Bill to investigate books. It was perfectly evident that in the last resort we were bound to obtain this power—and we subsequently did—although none of us wished to use it if it could be avoided.

Representatives of the following great firms attended the meeting—

Messrs. Vickers,
„ Armstrong, Whitworth,
„ Cammell, Laird,
„ Firth & Sons,
„ Hadfield, and
„ The Projectile Company.

At the first meeting one or two of those present made a serious blunder in launching an attack upon Lever and Mann, and it was necessary to explain that these gentlemen were only carrying out the specific instructions given to them, and that we had every intention of going through with the business. There was no answer to the question why, if other important engineering firms were prepared to make 18-pounder shells for 12s. 6d., we should pay any of them £1, or why, if others could make 4·5" shells for 40s., or thereabouts, we should continue contracts at prices ranging from 47s. to 65s. We were pressed to say who it was that was supplying shells at these reduced prices, but we could not very well be communicative on that subject, as we knew some of the firms were already acting as sub-contractors to some of those present. A strained, if piquant, interview terminated in an adjournment to consider the matter and to meet again in a few

days, for we had laid upon the table papers showing the prices that we estimated would be fair to pay until June, 1916, on the condition that three months' notice would be given of any proposed alterations.

The second interview was of a most amiable character. Sir Trevor Dawson, the Managing Director of Vickers, was indeed majestic in his exposition of the attitude of the firms, of their patriotism, their self-denial and their readiness to place their services at the disposal of the country. Had it not been for the good dose of original sin that exists in the meekest of us, the magnanimity displayed might have humiliated me. Lever, however, in a quiet and unobtrusive way had been doing some little calculations on a slip of paper which he put in front of me. It provided a stimulating antidote by showing that the figures now being consented to would represent a reduction as compared with current prices of £400,000 per week on the coming programme. A reduction in prices exceeding £20,000,000 per annum was not a bad justification to start with for the inauguration of the costing system, and in our conference afterwards, Lever and Mann metaphorically licked their lips with satisfaction and pulled up their sleeves in jubilant anticipation of extending the process to other commodities.

The following Table relating to some of the chief natures of shells shows the prices then being paid on current contracts and the reduced prices offered by the firms at the second interview—

HIGH-EXPLOSIVE SHELLS.

		Prices on current contracts.				Price proposed by Ministry.		Price proposed by firms.		
		s.	d.	s.	d.	s.	d.	s.	d.	
18-pounder	.	20	0	to	23	0	12	6	14	8
4.5"	.	47	0	"	65	0	34	0	39	6
60-pounder	.	60	0	"	82	4	47	6	52	6
6"	.	80	0	"	90	0	68	6	70	6
8"	.	240	0				142	6	157	6
9.2"	.	262	0	"	305	0	210	0	227	6

The Ministry accepted the prices proposed by the firms except for the 18-pounder and 4.5" shells. In the case of these two it was subsequently agreed that the prices proposed by the Ministry should be accepted as the basis, on the understanding that if satisfactory evidence were brought to prove their case, an increased amount up to but not exceeding the reduced offer of the firms might be payable. Such evidence was not forthcoming, and the prices were fixed at 12s. 6d. and 34s. respectively, on the basis of steel at £15 per ton, uncut. Prices remained more or less at the figures mentioned for some considerable time, but in March,

1917, a further reduction was obtained, though the 5s. rise in wages granted by the Committee of Production which would come into operation on April 1, 1917, had been taken into account. The prices as then revised were as follows—

Shells.	Reduced price March, 1916.			Price March, 1917.	
	s.	d.		s.	d.
18-pounder	12	6	..	12	6
4.5" howitzer	34	0	..	27	10
60-pounder	52	6	..	42	0
6" howitzer	70	6	..	61	6
8" "	157	6	..	132	6
9.2" "	227	6	..	187	6

It was subsequently ruled that increases of wages dictated by the Ministry should be taken into account and allowed for. Notwithstanding this, however, the estimate by the Department was that for the gun ammunition programme, 1917-18, after allowances had been made for economy in materials amounting to £12,000,000, the reductions in prices as compared with those previously paid represented a saving of £31,000,000 on the year.

There is no necessity to give details as to the results of this procedure when it came to be applied to the bulk manufacture of costly munitions, such as guns and their equipment. Even in small matters it represented big figures. The prices, for example, for loading Mills grenades had originally been placed at £11 11s. 4d. per 1,000, but was afterwards reduced to £4 per 1,000, while the original £12 10s. per 1,000 for loading ball grenades dropped to £3 15s.

The establishment of National Factories raised important questions of public policy and special mention should be made of the experience gained from the factories erected by the Explosives Department under the inspiration of Quinan. The evidence was strong that we were paying considerably more, for example, for cordite than we ought to pay, and the Cost Department provided detailed figures, containing liberal allowances for rapid repayment of capital outlay as well as for profit, which showed that a substantial reduction in the price paid per pound ought to be obtained. In the case of one private factory, it appeared that on prices then current a factory which had cost £464,000 could be written down to a scrap value of £50,000, and still allow a profit of 50 per cent. per annum on the capital employed.

In this matter, as in a good many more where national economy is concerned, the Admiralty were slow to move. The prices that we were proposing for cordite made liberal allowances for all charges and for a profit of 17 per cent., but the Admiralty had not then

taken up this business of ascertaining cost with any heartiness, and in April, 1916, when the cordite negotiations were being conducted, we were informed that—

“ My Lords were apprehensive that the cordial co-operation of the firms in increasing output of cordite may not be obtained if measures are taken to reduce the selling price of cordite to a figure at which little or no profit can be anticipated.”

The Ministry however proposed that the future basis price should be 1s. 6d. per pound instead of 2s. 3d., and finally, after friendly negotiations, a compromise was effected securing a reduction of 7½d. per pound. This figure was applied to the whole of our cordite prices, and represented a saving on the year's supply of £3,900,000. It should be added that the Admiralty afterwards made extensive use of the system.

The explosives programme required vast quantities of sulphuric acid, and if any justification was required for the type of State Socialism which we instituted under the special circumstances of the war, the story of the Oleum and Sulphuric Acid Factories supplied it in abundance. In May, 1916, the average price at which the orders for Oleum (Fuming Sulphuric Acid) had been placed in the United States was £12 per ton. The market price at that time was £30 per ton, but we were obtaining Oleum in large quantities from our own factories at 55s. per ton. The capital outlay on the factories in question involved an expenditure of £750,000, and, on the amount of Oleum we were then obtaining, as compared even with the price of the existing orders in America, a saving of £976,000 was effected in twelve months, and the repayment of the whole capital outlay in nine months.

Some of the chemical firms in this country are superior to any others, including those in Germany, in their scientific management and in economy of production, and the system which the sulphuric acid makers themselves adopted, in collaboration with the Ministry, of working out their costs on an agreed basis was most valuable. The arrangements placed a premium on efficiency. It came to be Quinan's practice to provide me every week with a chart showing in vertical columns the items of cost in the manufacture of a ton of acid in the different works. The firms of course were not named on the chart, and the numerical index was known confidentially to only a very few of us, but mention of it recalls an interesting incident.

I had a deputation one day from important acid makers, and in a friendly way, towards the end, one of them asked me, in view of the highly important information which must be available to me on

the subject of their manufacturing costs, what policy I should recommend the Government to adopt after the war with regard to safeguarding their industry? In reply, I asked the question, what he thought was required. He said "a 15 per cent. ad valorem duty." When our meeting was over I invited him into my room and brought out the numbered chart for the previous week at the different works and, having looked it up in the index, pointed to the column which represented the cost at his own factory. I did this because I happened to know that his costs were a good deal higher than some others. When we compared his column with others on the Table, I suggested that what he really required was not a 15 per cent. protection against the foreigner but a 100 per cent. protection against his neighbour. He was sensible enough to be grateful for the information and made it his business to effect improvements which reduced his costs in a remarkable way.

This costings business, indeed, gave rise to all manner of interesting incidents and provided an opportunity for an insight into the different industries of the country of an altogether unprecedented character. The establishment by the Ministry itself of a number of State factories was a bold experiment well justified in the result and probably unavoidable, but the accompanying power of control of materials, transport, and machinery was a vital factor and must be taken the fullest account of, for therein our proceedings differed completely from the conditions existing in times of peace. Lest, however, it should be thought that the foregoing summary is partial or too rosy, it may be well to quote from a review of the case as supplied by the Finance Department in April, 1917, when many of the National Factories had been in full operation for only a short time.

1. "National Factories. The capital expenditure on National Factories for gun ammunition components amounts, at the present time, to £25,000,000. As a result of this expenditure, goods have been produced at a cost of £33,000,000 which, if they had been bought at contract prices, obtained after the application of the costing system, would have cost £42,000,000. A saving of approximately £9,000,000 has therefore already been effected by this means, and, if economy is secured in future on the same scale, the whole capital cost of the National Factories will have been repaid in about eighteen months from the present date.

"It should be added that many of these Factories have been in operation for a short time only, and, in the case of those which have been the longest in operation, namely, the Factories for the manufacture of T.N.T., while the capital cost has been less than £1,500,000, goods have been produced at a cost of £3,500,000, which, at contract prices, would have involved an expenditure of £6,000,000. In the case of these Factories, therefore, a saving very much in excess of the total cost of the Factories has already been secured."

The factories included in the foregoing statement were, twenty-seven high-explosive factories, eleven propellant explosive factories, sixteen national projectile factories mainly for the larger shells, and thirty-two of the so-called national shell factories largely administered by the Boards of Management.

From the beginning of 1916 most of the War Departments adopted different systems of costings, and I think that on the whole the War Office became the most tyrannical of any. It is almost impossible to calculate the saving to the country effected by the War Office, the Ministry of Food and many others, but it must have been many hundreds of millions. So far as munitions were concerned, Lloyd George, in his speech in the House of Commons on June 23, 1921, in reply to the case that was being made against his appointment of myself as Minister without portfolio, estimated the savings on "shells alone" at £90,000,000. He failed, however, to point out that the high cost of Housing, which really gave rise to the debate in question and to the attacks on myself, differed in one fundamental particular from the case as it existed in munitions. In the one case we had been equipped with powers to control the cost and if necessary the industry, whilst in the other case no such powers had been granted.

Whatever may have been the total sums saved by the employment of the costing system during the war, it is a manifest absurdity that the State does not make use of corresponding methods with regard to its vast purchases in times of peace; for it must be remembered that at any time the purchases by the State, from envelopes to battleships, represent transactions on such a scale that the dealings of the greatest industrial concerns are trifling when compared with them, and it may perhaps be appropriate to close this chapter by some general observations on the subject.

The system of administration which was at first devised was frankly provisional, and the discussion of the technicalities of office organisation that are involved would not be of general interest. The position in which Lever was first placed by me was frankly, and intentionally, a very superior one, and it may well be that under a properly developed system it would be preferable for the Director of Contracts to have at his command the services of the costing experts, and that the ordinary division of the Finance, Accounting and Contracting Departments (as in the War Office) with a Financial Secretary, would be found the most convenient arrangement. At that time, however, with contracts to be entered into totalling hundreds of millions per annum, and with no knowledge of how long they might last, it was a dominant necessity to place in an unassailable position those whose business it was to

advise as to the prices which ought to be paid. I agree with what Lord Chalmers said in his evidence before the Select Committee on National Expenditure in 1902, that the essence of Treasury control is really the control of the department by itself reinforced by the Treasury. During the War it was impossible, under a system of votes of credit, that there should be continual going to and fro between the departments and the Treasury on the terms of individual contracts, and, indeed, I do not think that at any time it is desirable. The Treasury should be satisfied that the organisation in the department is in the hands of men who are of sufficient authority and independence and who are in close touch with itself. An ideal arrangement might be, that these men should be Treasury Officers themselves, but the old idea, that men who have gone into questions of prices in meticulous detail should afterwards have to discuss them with somebody at the Treasury who knows nothing whatever of the details of the case, is quite absurd.

In his evidence before the Public Accounts Committee, the Controller and Auditor-General, Sir Henry Gibson (after Sir Hardman Lever had described our system to the Committee) expressed the view that the system of which Lever was in charge at the Ministry of Munitions was adopted under abnormal conditions and was not generally applicable. Sir Henry's view as to the duties of the accounting officers may be the correct one; and the system at the Ministry underwent considerable development and modification. But the position in the organisation of those who are charged to give advice on prices is not the main point. The one thing of dominant importance is that the chief person responsible for advising as to costs should have direct access to the Minister.

In reviewing this system, the Select Committee on National Expenditure, appointed by the House of Commons, stated in their Report of October 24, 1917, that —

"Although your Committee recognise the conditions of urgency and stress which prevailed at the time when the Ministry of Munitions came into being, we consider that the Government should have taken steps *before now*¹ to establish such a measure of control as would have enabled the Treasury to satisfy itself that the capital expenditure on contracts for munitions were being made by the Department only on terms that were carefully considered and were reasonable."

Subsequently the Select Committee went further in their review and recommended on March 6, 1918—

"That the Technical Costing Section, whether removed from the Contracts Branch or not, be immediately strengthened, and the work of all engineering costing in the Ministry be undertaken by it."

¹ The italics are mine.

The Select Committee suggested that, in their natural keenness to obtain supplies, the officers concerned were indifferent to cost and that they were disinclined to press the producers in trades in which they themselves had in many cases been engaged. This goes beyond anything which came within my own cognisance, but it was natural, and, indeed, inevitable, that the men who were being exhorted by the Ministry, by the Army, and by public opinion to produce supplies, should be fretful sometimes over any risk of delay that arose out of questions interposed by those who had the responsibility for drawing up the contracts.

The reader may well ask: Why did the Select Committee of the House of Commons not report upon the desirability of Government departments enquiring into costs before 1917? It is a very important question and the answer to it is to be found, not in exploring the work of the Treasury or of the Controller and Auditor-General who have done the work allotted to them with consistent fairness and efficiency, but in the proceedings of Parliament itself and of the Press which helps to mould public opinion. A Public Accounts Committee of the House of Commons has been in existence a long time, and it was almost incredible that after all those years of talk Parliament had not insisted upon the creation, either in the Treasury, or in the individual departments, of some organisation whereby the State could be fairly and accurately guided in determining the prices it had to pay, and thereby be protected, at all events in some measure, against the system of public plunder to which it had been subjected. The system could well be worked without the employment of powers that are either tyrannical or unreasonable, and my experience is that efficient and progressive firms do not object to fair questions as to cost of manufacture. At one time it seemed as if, following the Reports of the Select Committee, some such system would be instituted, but in the post-war reaction that prospect is becoming dim. The real reasons for all this are to be found in the character of the discussions on the estimates in the House of Commons, as well as in the character of the proceedings of the Public Accounts Committees. If Parliament wants this thing done it can get it done; but unfortunately for some years past under the guidance of men like Lord Banbury, aided and abetted by publicists of the quality of Lord Rothermere, public attention has been focused, for example, upon the number of typists or charwomen that a department employs, and when a few of the typists or charwomen have been got rid of, these exponents of "economy" plume themselves before the public as protectors of its purse. I never found at the Ministry of Munitions that any of these persons, or their like, asked the

very necessary question as to whether we ought to pay as much as 21s. for an 18-pounder shell case. Whenever we ascertained with sufficient accuracy what the cost of an article ought to be, we nearly always found that we were paying too much. The ascertainment of the cost, say, of a super-dreadnought, or of a round of ammunition, may well necessitate the employment of an expert staff and of extra typists, and even of a charwoman or two to keep the offices clean, but the result will certainly pay many times over the cost not only of the typists and the charwomen, but of the whole staff of the department. This was the case repeatedly at the Ministry of Munitions, and I am quite convinced that it would be the case again if this system were adopted. It is strange that the Banbury type of economists, and the "stunt" Press, do not help to focus public attention upon this necessity. Why not? I remember on one occasion the Treasury objected to my employing a certain type of officer at a greater salary than £250 a year. My reply was that in order to ascertain the costs and deal with the very important and influential people concerned, it was necessary to have a man of ripe experience and sufficient quality, and that a man of that kind could not be obtained at such a salary. I was therefore for this special work authorised to employ one man at £1,000. The first task he was allotted was the ascertainment of the cost in connection with a proposed contract which the £250 a year man had unsuccessfully endeavoured to deal with. Within the first week of his appointment he had secured a modification of the contract which saved the country, on that one undertaking, £50,000—or his own salary for fifty years. Sir John Bradbury asked me on one occasion what I thought we ought to pay to a Chief Cost Accountant, if the Government decided to employ one. My reply was that, "If you can get the right kind of man, you must pay him his price. Pay him £10,000 a year if it is necessary to get him. He will possibly save you his salary for the whole of his life within the first month of his work." He asked me if I thought Parliament would agree to such an appointment at such a salary. I said: "No, I do not. You would have Banbury moving the adjournment of the House; large headlines in the papers about the squandering of the taxpayers' money, and the Government would not stand up to it." When the directors of a great railway company or of an industrial concern desire to investigate charges, they are perfectly willing to pay for it, and they know that it pays them to do so. If a system of this kind became an established part of the State's machinery, the right men would probably be obtained at salaries equivalent to those paid to other chief officers in the Civil Service. Up to the present,

however, the people who are looked upon as the champions of economy are those who have never raised their voices to encourage enquiry into prices or to protect the State against the kind of over-payment that we discovered. On the contrary, they have succeeded in so moulding public opinion that the discharge of a few clerks on the plea of economy is received with acclamation and serves to quieten uneasiness.

CHAPTER VIII

TRENCH WARFARE

The Cry from the Front—Appointment of Jackson, Roger and the Scientific Committee—Deplorable Position of Grenade Supplies—Ian Hamilton's Request—First Successful Effort—Jackson's and Leeming's Reports—Demands from France—Churchill—The Mills Grenade—Helmets and Shields—Flame Projectors—The Wembley Demonstration—Trench Mortars—Stokes and his Mortar—Smoke-clouds—Work of Trench Warfare Men—Other Mortars—Gas Warfare—German Activities—Work of the Scientists—Possibilities of Chemical Warfare.

NO department of the Ministry provided such a succession of interesting and dramatic episodes as the Trench Warfare Supply Department. The demands from the front were urgent and indeed pitiful. "Send us something or other that we can chuck at the Bosch, and send it quickly," was the burden of them, and often they came to us through quite irregular and unauthorised channels. The suggestions were almost numberless, but running through them all was the same note of agonised urgency.

Trench warfare on an extensive scale was presumably out of date before the war, although one would have thought that the experiences of the Boer War would have called renewed attention to it. As the result, however, of the experiences of siege warfare at Port Arthur, in 1904, a standard grenade had been designed for the British Army, but there appears to have been no attempt made to provide substantial supplies. The German Army, on the other hand, provided itself with grenades of a standard pattern, as well as with trench mortars.

General Rawlinson, with his usual foresight in these matters, had emphasised the need for supplies of grenades and trench mortars in December, 1914, and reported that the war was causing "a demand for all sorts of things which are not recognised by regulation." A certain number of jam-pot and other grenades had been sent out, but, seeing that the troops were making an assortment of them for themselves behind the lines, I never could understand how it was that, from the beginning of the war to June, 1915, only some 16,000 Mills grenades had been supplied altogether, and

that a small percentage only of the trench mortars required had been put on order.

It is to be hoped that the War Museum will contain a good selection of the improvised missiles that the poor fellows put together in and behind the trenches for throwing at the Germans. The collection of tin-cans filled with any kind of explosive that could be got hold of must afford as striking a commentary upon the tenacity and bravery of our men as anything that the war affords. Had it not been for substantial supplies of excellent grenades that were produced behind the lines by men like Captain H. Newton—to whom General Plumer had allotted a workshop—one wonders what the men would have done. Later on Plumer was good enough to lend Newton to us for a time and we were indebted to him for many suggestions for more rapid and economical production. He was responsible also for an improved pattern of mortar, and one of the simplest, cheapest and most effective percussion fuses.

Major-General Sir Louis Jackson was transferred to us and placed in charge of the technical and scientific side, and I appointed Sir Alexander Roger, from Lord St. David's firm, as head of the manufacturing and supply side. The responsibility for the provision of trench warfare supplies was nominally transferred from the War Office towards the end of June, and I appointed a committee of experts, known as the Scientific Advisory Committee, to assist in working out the many technical and scientific questions that arose. Owing to our shortage of scientists, the burden of labour and responsibility that was cast upon these splendid men was enormous. Some of them broke down under the strain, and there was no wonder.

I will not disguise the fact that many of us felt a real sense of resentment against those, whoever they were, who had hitherto had the handling of trench warfare supplies. More than once I let myself go pretty freely to General Von Donop on the subject. Indeed, although the transfer of duties was nominally effected in June, it was not until July 3 that the department received from a certain Major Banks a statement of the kind of grenades that we were to supply, and July was well advanced before we received full instructions as to types and specifications of the trench mortars that were required.

GRENADES

With regard to grenades, we were told that they were to consist of a daily supply of 10,000 rifle grenades, 30,000 Mills grenades, and two other types of hand grenades, making up in all a total of about half a million per week. As already stated, except for a handful of Mills grenades the supplies were negligible, and the

position was immediately examined. Roger's report upon it was a most disconcerting document, as the following quotations suffice to show.

He found that

"no single contract provided for the production of the complete" [rifle] "grenade, with its indispensable accessories. In one case, whilst grenades with cartridges were provided, no boxes or tins had been included. In another, grenades were provided but no cartridges, and, in a third, empty grenades but no filling and no detonators, which are of a special pattern, difficult to get and of a slow production."

As regards the first type of hand grenade (R.L.),

"we took over three contracts. No one of these contracts was for the complete grenade, and no arrangement had been made for filling or for detonators."

For the second type of hand grenade (Mexican), there appeared to have been one cancelled contract for the supply of a small number of grenades, but

"as to placing orders with other firms and so extending the production, it is impossible until we have received from Woolwich drawings and specifications, both for the grenade itself, its accessories and for the filling apparatus."

The only item for which there appeared to be contracts for the completed article was for the Mills grenade. There were five such contracts for complete grenades and fifteen for empty grenades without detonating apparatus, and arrangements for filling and manufacturing on a large scale had to be created from the beginning. The report continued that it would be very many weeks, at the best, before a substantial supply would be forthcoming. I was convinced that an output, even of 70,000 per day, would ultimately prove to be insufficient, and I therefore instructed Roger so to organise his department and plan his arrangements as to be able to produce, if required, a supply of a million grenades per week of the approved patterns.

We found that we should have to wait some time before abundant supplies of the selected patterns would be forthcoming, so that it was urgent to find something which, even if not perfect, would serve as a stop-gap. The necessity for this emergency provision was soon revealed.

On July 9 a telegram from Sir Ian Hamilton was sent to us, in which he said—

"I should be very thankful for as many bombs of this or of any other kind of bomb that you can spare. Anything made of iron and containing high explosive and detonator will be useful. I should be greatly relieved if a large supply could be sent overland, via Marseilles, as the bomb question

is growing increasingly urgent. The Turks have an unlimited supply of bombs, and our deficiencies place our troops at a disadvantage, both physically and morally, and increase our difficulties in holding captured trenches. Could you arrange for a weekly consignment of 10,000 to be sent to us regularly ? ”

NOTE.—Bombs in the above telegram included hand grenades.

The response that was made to this request is worth quoting, not only because it proved that an emergency grenade could be devised and supplied rapidly, but because it illustrates so well the readiness which men of all types throughout the country, employers and employed alike, were ready to display if only they knew definitely what was wanted.

The Report of the action taken was as follows—

General Jackson to Dr. Addison

DR. ADDISON,—

On Friday evening the 9th instant a telegram from Sir Ian Hamilton asking urgently for a large supply of bombs was passed by you to this directorate.—“ Anything made of iron and containing high explosives and detonators will be useful.”

A pattern of cast-iron grenade that could be quickly made was selected and Lieut. Leeming started with it the same evening for Manchester, Captain Trelawney going to Gathurst for the explosive. The arrangements for the necessary detonators, etc., were made here.

It was ascertained that a vessel was loading for the Dardanelles and could receive cargo up to the 18th.

Within seven days from the start 25,000 grenades with fuses out and detonators were made, loaded, inspected, packed and despatched to the steamer in charge of Mr. Gray of this directorate.

This quantity is trifling compared with what we hope to work up to, but as a first combined effort with a new pattern and new firms it is highly satisfactory. As far as this branch is concerned, the credit belongs entirely to my staff, and especially to Mr. Leeming, as I was in France when the order came.

The enthusiasm displayed by the various firms and their employees is still more satisfactory. I am told that some men worked for forty-eight hours at a stretch. I hope the Minister will approve of sending letters of thanks for their work.

Lieut. Leeming's detailed report is attached.

A later telegram from Sir Ian Hamilton asked, among other things, for 50,000 bombs and catapults. We were able to send,

besides the above 25,000, 10,000 pitcher grenades and 5,000 phosphorous bombs, making 40,000 in all, as an immediate instalment, and all the catapults.

(Sgd.) LOUIS JACKSON,
D.T.W.

July 17, 1915.

Captain Leeming to General Jackson and Mr. Roger

In accordance with your instructions received at 8 p.m. last Friday, the 9th inst., I proceeded to Manchester at midnight, with the object of obtaining 10,000 (ten thousand) hand grenades within one week, Mr. Gray and Corporal Warren accompanying me as assistants.

My plan was to proceed to Messrs. Musgrave's of Bolton, Messrs. Platt Bros.' of Oldham, and Messrs. Asa Lees', Oldham, and I wired to these firms to meet me at their works on Saturday morning.

On arriving at Manchester at 6 a.m. Saturday morning, I managed to obtain a touring car by about 6.45 o'clock, proceeded to Bolton, arriving at Messrs. Musgrave's at 7.40 a.m., where I found Mr. Bentley, one of the principals, awaiting me. From previous knowledge I felt sure we could count on this firm's hearty assistance, and quite within five minutes of my entering the place, Mr. Bentley had draughtsmen at work taking accurate drawings of the only sample I had, and which could not be left with them. I briefly sketched out details of the box for packing, arranging at the same time to leave an empty compartment in each box for detonator and fuse, wired to London for corrugated paper for packing grenades, also for copper detonator sleeves for grenade caps, to be forwarded passenger train.

Mr. Bentley then got together a deputation of his workmen, including pattern-makers, core-makers, moulders, machinists and box-makers, and I briefly explained the vital urgency of utilising every effort to get the grenades through quickly. The keenness and interest at once left no doubt whatever in my mind as to everything possible being done by them to hasten matters.

These works I left at 8.45 a.m., breakfasted in Bolton, proceeded to Manchester, calling at the City Surveyor's Office for any messages, where I had requested you to communicate with me. A punctured tyre delayed me some time, and Messrs. Platt Bros.' new works at Werneth was reached at about 12 noon. Mr. Needham, chairman of this large concern, which employs over 12,000 (twelve thousand) men in ordinary times, was waiting to receive me along with Mr. Nuttall, and on hearing of the urgency of getting deliveries and work moving within a few hours, he telephoned across for Messrs.

Asa Lees & Co.'s director, Mr. Lawton, the representative of two small neighbouring foundries, and also for Mr. Marsden, senr., managing director of the old works of Messrs. Platt Bros. & Co. (the latter being practically a separate concern). To the whole of these gentlemen I talked at once, whilst draughtsmen were again taking drawings of my sample grenades; plans of the boxes for packing were given as before, supplies of copper sleeves telephoned for from London, and within about an hour matters were moving quickly.

Whilst at Messrs. Platt Bros. & Co.'s, Mr. Needham telephoned to Messrs. Thos. Robinson & Sons, of Rochdale, and Messrs. Tweedales and Smalley, of Rochdale, and arrangements were made for me to meet the directors of these two concerns at Messrs. Robinson's works during the afternoon. At about 3.30 p.m. I arrived at Messrs. Robinson's and saw Mr. Charles Robinson and Mr. Tweedale, of Messrs. Thos. Robinson & Sons, and Mr. Ernest Tweedale, junr. of Messrs. Tweedales & Smalley. The same keenness was displayed here as in all the previous works, all machinery was set moving within a few minutes to start work, but naturally, being late on Saturday afternoon, these firms were more handicapped than anybody. Mr. Ernest Tweedale proposed to get Messrs. Thos. Holt & Sons, also of Rochdale, also at work, and to superintend their operations and to give them all information himself.

I may point out that it was a local holiday in Oldham and Bolton on Saturday, and motor-cars had to be sent all over Lancashire to bring back various skilled workmen to the works. Several hundred patterns and core-boxes were made, patterns pinned on plates, cores made and sent to dry, case-makers set to work, moulders obtained and arrangements made for the cupolas to be working on Sunday, and generally hundreds of little details to be attended to.

The article being new to everybody, there was necessarily a certain amount of experimenting to be done to find out the best and quickest manufacturing processes, jigs had to be made for turning, screwing, making caps, etc.

To overcome all these difficulties, I kept in touch with all manufacturers by telephone and motor-car, and wherever I found one had better and quicker methods than others, I kept the latter informed and got them to visit other works to see what each one was doing. The hearty co-operation shown by them was really amazing, each manufacturer throwing his works open to the full extent to his competitors in ordinary times, and assisting in every possible way.

On Sunday morning I proceeded to Huddersfield by motor-car, met Mr. Greenhalgh of the Standard Fireworks Co., told him of the arrangements already made for delivering, and got full instruc-

tions from him as to the best routes for the motor wagons to take from the works in Lancashire to his works in Huddersfield. I learned here that Captain Trelawney had obtained the ammonal and was on his way to Huddersfield from Wigan regarding loading arrangements.

Coming back from Huddersfield, I called at the works of Messrs. Asa Lees & Co., and Messrs. Platt Bros., of Oldham, inspecting the work here as far as it had gone. It is interesting to state that in exactly twenty-four hours from first having information, this latter firm had completed castings, started the drilling and tapping, had a lot of caps cut and screwed, and were drilling same, and generally everything was well under way.

Whilst I was at Huddersfield, Messrs. Gray and Warren were at the four works at Bolton and Rochdale ; every works had arranged for a blow for moulding on Sunday evening at the latest.

Boxes were also well in hand at each works. On Monday arrangements for motor lorries were made and they were waiting at the door of each works by the evening. I made the round of the works from Oldham to Bolton and back, calling at most places twice, arriving at Messrs. Platt Bros. at 6.30 p.m.

A telephone message came through from my headquarters at the Midland Hotel to the effect that something was wrong with the detonator tubes that had been sent us, and the man had left London to explain matters. I immediately went back to the hotel and at 10 p.m., on the arrival of the messenger, found that the one sample detonator he had brought would not enter the detonator sleeve, owing to the latter being constricted when supplied.

Two motor-cars had to be requisitioned, and two parties set out and worked all during the night, stopping the manufacturing of caps then proceeding, having fresh gauges made for drilling caps for fuses, re-drilling afresh and expanding new tubes in. This delayed work practically one day and rather upset matters. The first delivery of about 300 was made by Messrs. Platt Bros.' old works, Mr. Marsden, senr., taking them over in his own car, so that the loaders at Huddersfield could practise.

A further delivery was made from Messrs. Tweedales and Smalley on Tuesday evening ; by Wednesday evening over 10,000 had been made and filled completely. By Friday, 5½ days from the start, over 25,000 grenades had been manufactured and delivered at the Filling Works, and by Saturday morning, 6½ days from the start, 25,008 in 2,084 cases had been manufactured, filled, fuses cut, detonators packed in each case and loaded on train.

The co-operation and keenness displayed both by manufacturers and workmen were simply amazing ; competitors in ordinary times

were entering one another's works and helping each other out of difficulties. The workmen worked all hours without question or rest.

I would suggest that letters of thanks be sent to the following—

- Mr. Bentley and Employees of
Messrs. J. Musgraves & Sons, Ltd.,
Globe Iron Works, Bolton.
- Mr. Needham, Chairman, and Employees of
Messrs. Platt Bros. & Co.,
New Works, Werneth, Oldham.
- Mr. Marsden and Employees of
Messrs. Platt Bros. & Co.,
Old Works, Oldham.
- Mr. Lawton and Employees of
Messrs. Asa Lees & Co.,
Soho Iron Works, Oldham.
- Mr. Charles Robinson and Employees of
Messrs. Thos. Robinson & Sons, Ltd.,
Railway Works, Rochdale.
- Mr. Ernest Tweedale and Employees of
Messrs. Tweedales & Smalley,
Castleton, Manchester.
- Messrs. Thos. Holt and Employees of
Messrs. Thos. Holt, Ltd.,
Rochdale.
- Mr. Greenhalgh and Employees of
The Standard Fireworks Co.,
Huddersfield.

May I also mention that Mr. Gray, Corporal Warren, A.S.C., and Mr. R. A. Carr (all of our staff), rendered valuable services in Manchester, and Mr. Haigh in London.

July 17, 1915.

(Sgd.) J. A. LEEMING,
Lieut., R.E.

It would be a sacrilege to attempt to adorn this glorious tale, but there were scores more of the same kind in those days. I would to God that we could bring something of the same grand

spirit of united effort into fighting some of our enemies at home these days!—Slums, for instance.

Captain Leeming was one of the most modest of men ; short in stature, with a somewhat stodgy quietness of manner, but with very bright and alert eyes beneath his high forehead, and brimful of workshop knowledge. He was one of the leaders in the mining operations on the Western Front until he had had to be invalided home. He made light of his disabilities, and, despite cautions and exhortations from many of us, he was remorseless in his work for the Trench Warfare Department. Towards the end of the war, however, his strength gave out, and he died in hospital. We had no braver or more resourceful man amongst us, and, if they had only known it, many men in the trenches, who found themselves equipped with an abundance of missiles, owed their emancipation from their former horrors of helplessness to Leeming. His monument was a better equipment of the men in the trenches, where he himself had spent so much time and received the injuries that were fatal in the end.

The lesson of this emergency performance was that, if these things would do for the Dardanelles, why could they not be used in France ?

No satisfactory reply to this question was obtained until July 20, when all the papers relating to the subject were requisitioned on my order from the War Office. An examination of them revealed that a month before, on June 21, Sir John French had written for a plentiful supply of grenades, and had said that, whilst preferring the approved patterns,

“hand grenades of any type available may be sent out in as large quantities as possible to meet the urgent and growing demands received from the front.”

This letter had been in the possession of the War Office all this time and had been minuted about, but we had to discover it for ourselves in the papers on July 20.

Thanks to the previous Dardanelles case, French's request could be responded to immediately. An output of 50,000 emergency grenades per week was reached within a fortnight, and within a few weeks it rose to 300,000 per week.

The Dardanelles case had its sequence in a number of delightful, if tempestuous, incursions from Winston Churchill. His anxiety over Gallipoli was of course shared by all of us, and there was the added poignancy of his own personal share in the expedition. Churchill has often laid himself open to public criticism, and he and I had many differences of opinion without interfering with a sincere mutual regard, but he was badly treated about this Darda-

nelles business. The conception was sound enough. The thing was mismanaged. In those days Lloyd George, frequently, and I, occasionally, were subject to visits from Churchill, and it often happened when he came to see Lloyd George that I was called upstairs and cross-examined : When would so and so be forthcoming ? Why were there not more of them ? Who was responsible ? What was being done about it ? And so forth.

At these interviews Lloyd George used to play the part of the amused spectator, for it was not my habit to take the inquisition lying down. I see from my diary of Tuesday, July 27, that for once we were able both to surprise and to please Churchill. He had come across anxious and a bit excited over the despatch of grenades to the Dardanelles by a ship that was going in two days' time. After the usual telephoning, we found that, thanks to the experience gained previously, we were able to ship 63,000 of various kinds within forty-eight hours.

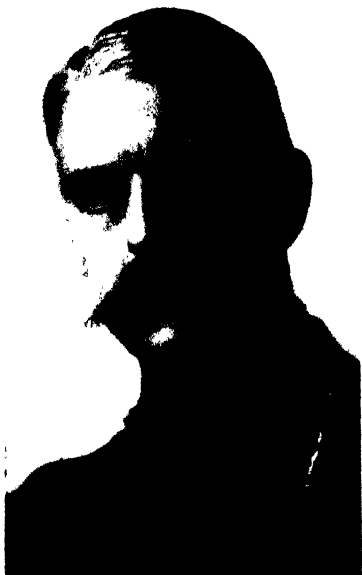
It was not long before Jackson's and Roger's teams produced an abundant supply of grenades. By November, 1915, the output—chiefly of approved patterns—had risen to 900,000 a week. France and the Mediterranean had got all they wanted, and supplies were being sent to the African and Mesopotamian expeditions, as well as to the Russians and the Serbians.

Why was it that, if in four months the supply could thus be brought up from 20,000 a week to 900,000, the first nine months of the war had passed with only an insignificant trickle to the men in the trenches ?

After a time the " Mills " grenade, originally designed by Mr. William Mills, of Birmingham, and submitted in January, 1915, became the chief standard pattern, although it underwent many modifications and improvements. It received a time-adjustment, and eventually, in a modified form, became adapted to firing from a rifle, and thereby supplemented the supply of the " Pippin " rifle grenade, commonly called the " Newton Pippin," after its ingenious inventor.

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Enough has been said on grenades ; and space compels me to refrain from describing many of the tasks which the Trench Warfare Department had to undertake in addition to regular supplies. The staff seemed to be able to tackle anything, or to lay their hands on somebody who could. In later days, whenever I wanted cheering up a bit I used to go across to the Board of Education, where Roger and his happy and efficient group of engineers and experts were installed. Their alertness and energy acted like a tonic. The



MAJ. GEN. SIR LOUIS JACKSON, R.F.



SIR ALEXANDER ROGERS



THE EARL CAPE J. A. LEEMING, R.F.



MR. L. A. HAIGH

quiet and efficient E. V. Haigh was the second in command, with Captain P. A. Cooper his deputy. Leeming, the outside engineer, was to be found there sometimes, and Captain F. V. Lister, who managed smoke-clouds and all sorts of abominations. Lieutenant L. G. Shadbolt was responsible for chemical grenades, Captain H. Moreland and Lieutenant F. W. Bain for gas supplies, Mr. J. Mac-kintosh for helmets and many sundries; Mr. Leever, Captain G. Elliot, Captain W. R. Ellison and others for mortars—together a splendid and cheerful band of men who formed an ideal working alliance with Jackson and his scientists and experts.

The Inventions Department was another ally of these men. It had been set up originally under Moir, and was under his direction until he went to America to superintend the production side of our contracts there. Moir handed it over to Colonel Sir H. E. F. Goold-Adams, a member of the Ordnance Board, and one of the coolest and most ingenious of the soldiers attached to us. One of the early tasks of this Inventions Department was to help Trench Warfare in designing the steel helmets which began to be asked for in July, 1915. In the autumn of 1915 a large number were supplied of a type that was at first thought to be efficient, but which were afterwards withdrawn as being insufficiently bullet-proof. We were indebted to the experts of Messrs. Thomas Firth & Sons for devising and producing the steel that was finally adopted, and they acted as instructors to other people.

I am indebted to General Cubitt for a Report from the Army Medical Department of the first effective trial in attack of these helmets, in March, 1916. It related to a fight at the Bluff on March 2, and Sir Anthony Bowlby, Bart., F.R.C.S., made a special report upon the casualties, particularly in the 1st Gordons and the 8th King's Own. There were 960 men during the day in No. 10 Casualty Clearing Station, and according to previous experience the number of skull fractures amongst them would have been thirty, but that day there were only four serious ones, while three men had only slight fractures. The experience, such as it was, made officers and men enthusiastic for the helmets, and Field-Marshal Earl Haig wanted more and more, and as quickly as possible.

After the helmets had become established, many patterns of steel waistcoats and body-shields were asked for and supplied. One of them, it appeared, had been named by the Inventions Committee after myself, because, as they explained, I was their patron saint. The defect of this type of equipment, however, except for small raids and minor enterprises, was that it was too heavy. So far as they were used at all, by June, 1917, opinion had crystallised in

favour of the so-called "Addison" shield, which weighed six and a half pounds, and 200 of them were supplied per division, but no general demand came along. The fact was that Tommy was so hung about with equipment that he became a sort of general store, and anything which added even a pound of weight was rightly looked upon with disfavour.

Another device, which was experimented with for a long time, but which happily never came into general use, was the flame projector. No one who saw this thing in use could regard it without a shudder, for, when lighted, it shot out a fierce consuming flame for eighty yards that scorched up everything within its range. The machine was twisted about like a searchlight, and I confess that when standing near it I devoutly hoped that nothing would go wrong with the horrible thing, so that by some accident or other it would suddenly switch round. It achieved more by its moral effect than in any other way. As a matter of fact, in one of the first considerable German flame attacks, we had only one man burned. A deep trench afforded protection against it. The heavier sets of flame machines were difficult to instal, and the lighter ones had a short range. Captain W. H. Livens, at the Front, with Captain F. C. Vincent and Mr. J. Mackintosh in trench warfare, put in a lot of work at these things, and Livens sent us a detailed account of the first use in attack of the heavier instrument. The effect was demoralising enough upon the enemy in the immediate front, but it did no harm to men who kept in deep trenches. Where, however, the apparatus was known to have been installed, it drew a heavy fire on that section of the line, and generally, to our infinite relief, this machine of horror was not a success.

One of the trials of the original flame projector remains fixed in my mind by the look of dismay on Jackson's face as the spectators assembled. It was in September, 1915, and it had been arranged that various officers from the Front should witness the trial at our experimental ground at Wembley. Most elaborate care had been taken to preserve secrecy, and nobody except the men working on the machines, Lloyd George and myself, knew what was going on. The expression of polite consternation on Jackson's face when a bevy of persons turned up may therefore be well imagined. Asquith, Lloyd George, and the generals, of course, were there, but it was scarcely to be expected that secrecy would remain very profound when it came to be treated as a fireworks display, for different distinguished persons had made themselves responsible for visitors. For my part I gave it up, and never knew who all the visitors were who had received permits. The only people I knew were Mrs.

Asquith, her little boy, and a friend with them, and I told Jackson to be content with seeing permits. We learned a lesson, however, from this, and did much better with our grand trial of the Tank later on.

Although the flame projector was accordingly not developed, there arose out of the experiments connected with it an invention we owed to Livens, in collaboration with his father. It was known as the "Livens" projector, and was competent to discharge drums containing various materials up to nearly 2,000 yards. They were used with great effect at the battle of the Vimy Ridge, in April, 1917. Subsequently these projectors were supplied in great numbers, and became adopted as a service pattern not only by ourselves, but by the French and American armies; and towards the end of the war they were beginning to be used by the Italians.

TRENCH MORTARS

Before the war the trench mortar had been discarded. Some patterns were in existence, but most of them were complicated, slow in action and difficult to manufacture. The long-continued trench warfare, however, soon made men as clamorous for them as they were for grenades. Although the Germans were beforehand with this weapon, the French and ourselves ultimately became possessed of a vastly greater and better equipment. In October, 1914, the Commander-in-Chief had asked for something that could be managed from the trenches, or near them, which threw a very heavy bomb for a moderate distance with fair accuracy. A number of patterns were devised either by the Ordnance Department or by armament firms, and trials had taken place. Some had been manufactured, but from October, 1914, to June, 1915, there had been no material output save what the men fabricated for themselves behind the lines.

Amongst the patterns in existence in June, the 2" trench mortar was most asked for. This threw a 50-lb. bomb, and we were a good deal dismayed to find that only twenty-five had been ordered. Most of these came in during June, but it was a shock to be informed in July that whilst a weekly output of 250 bombs for the twenty-five trench mortars had been arranged, the real demand was for 10,000 bombs per week, with an appropriate number of mortars.

For many weeks we had great difficulties in obtaining samples and specifications for them. Altogether, it was impossible to fathom this business or to understand why the Ordnance Department of the War Office seemed reluctant to abandon trench warfare supply when their supplies were so completely negligible and

when they had no arrangements for securing sufficient quantities in the future.

Nevertheless, trench mortars provided one of the outstanding inventions of the war ; and the " Stokes " mortar, after an infinity of troubles, came finally into its own. Sir Wilfred Stokes was one of the directors of the firm of Ransom & Rapiers, Ltd., and in August, 1915, at my request, he wrote me a letter giving a full account of the origin of the mortar and of the difficulties he had encountered.

He told me that the idea originated by Mr. Gwynne, of the *Morning Post*, asking him if he could not invent some rejoinder to the German frightfulness on our trenches, and from January, 1915, onwards he had been struggling with his invention. The idea, like most good ideas, was exceedingly simple. It consisted of sliding a cylindrical shell down a tube, or barrel, the shell being automatically discharged when it reached the bottom of the barrel by a small cartridge, enclosing propellant and fitted with a cap like an ordinary shot-gun cartridge, striking a pin at the bottom of the barrel. It would fire ten rounds in the time any of the established mortars would fire one.

It was one thing, however, to have a good idea and quite another to transform it into an efficient and reliable weapon of war. There were more squabbles, difficulties and recriminations over the progress of the Stokes mortar than over any other single thing that we had to produce. By the time I got to know him, Stokes had, I think, come to look upon anybody connected with Government or with artillery questions, as his natural enemy. He had become exasperated. On more than one occasion his invention had been rejected by the experts. His experiences, indeed, were like those of many other inventors whose invention does not make as rapid progress as they think it deserves to do. For quite a long time it was difficult to convince him that we were anxious to help, although at my urgent request his mortar had been re-submitted to the Ordnance Board early in July and the men in Jackson's department were doing everything they could, with the help of Goold-Adams and General Minchin from the Ordnance Board, to overcome the technical difficulties that cropped up. Indeed, Stokes himself, as experience developed, was responsible for almost as many suggestions for modifications as anyone. He was not an easy man to satisfy, however, for during 1916, when more than a thousand mortars were in use in the field and the output of filled bombs was more than 100,000 a week, he was still not content. In his more lenient moods he was inclined to admit that perhaps he himself might have had a share in intensifying some of the early difficulties,

for he did not pretend to endure fools gladly, or to be a pattern of meekness.

So far as the Ministry was concerned the thing began by Captain J. F. F. Trelawney, one of the trench warfare experts, bringing a sample of the gun to Jackson on June 26. Many of the best men were put on to it at once, and four days later Lloyd George, with Churchill and General Ivor Phillips, witnessed a demonstration at Wormwood Scrubs. They were enthusiastic about it.

The greater part of July was occupied in overcoming all sorts of technical difficulties, but a letter from Robertson at the Front gave a good account of the unofficial trials and determined me to order twenty guns with appropriate bombs and get permission afterwards. The manufacturing trials went well, and preliminary orders were then given for the supply of several hundreds of the necessary tubes. Successful trials with these were held early in August, and on the 13th Lloyd George decided to order a thousand, and, by an entertaining coincidence, three days later the Ordnance Board wrote suggesting that a thousand might be put in hand.

The first event of military importance connected with them was the use of those supplied on the first order for the production of smoke-clouds, and the delivery of them happened to coincide with a characteristic incursion by Churchill. On the strength of a conversation with an officer who was not fully aware of all that was going on, he had sent a letter by his Secretary to Lloyd George expressing anxiety that Stokes guns should be available for use at the Dardanelles, and making the extraordinary statement that "no action has yet been taken towards getting them." We had a couple of fairly stormy interviews on this subject, with Lloyd George referee, as usual. On the second occasion it happened that I had been furnished a few minutes before with a piece of useful information. General Wardrop, from G.H.Q. had been over on August 26, and a special effort had been made to supply Haig with thirty Stokes guns and 10,000 complete shells for producing smoke-clouds, and it appeared that at the moment that I was having to meet a charge that "no action had been taken," the first thirty Stokes guns with the 10,000 shells complete were on a railway train on their way to France. There was great resentment amongst the men in the department, who knew that they had been assailed, and corresponding elation a few days afterwards when Haig wrote personally to them expressing his appreciation of the ready and prompt response to his request and reporting a most successful trial. Haig also wrote to Messrs. Eley Bros., who had prepared the smoke mixture, and individually to Lieut.-Colonel J. C. Matheson, R. E., Captain F. V. Lister, and to Mr. M. G. Weekes,

who were our experts, and who had done most of the work. It was characteristic of Haig ; and the men often chuckled over the smoke-cloud attack of September, 1915, as the product of "no action."

These incidents connected with Churchill are worth recording because they reveal the one quality in his attractive and powerful personality which has, I think, prevented him from securing that hold in the counsels of the country that he would otherwise have obtained. His energy, and his lucid, if tempestuous, exposition of a case are not surpassed by any public man, but, somehow or other, every now and then, when his prejudices or predilections are deeply stirred, he seems to lose sight, or not take sufficient account, of the governing facts of a case. In this instance it was his enthusiasm to get help for the Dardanelles expedition that drove him forward. Like the rest of us, he was fretted and exasperated by the difficulties which had to be overcome before the Stokes guns could be supplied in abundance ; but the difficulties were there all the same, and exasperation could not take the place of the hard work that was necessary to overcome them. Just in the same way his horror at the outrages of the Bolsheviks in more recent times prompted him to lose sight of the real deficiencies of Koltchak and Dennikin and of their impossible methods. Nineteen times out of twenty he will get a grip of facts as quickly and as clearly as any man and evolve a sane and practical policy out of them. There is also nobody more loyal to the best traditions of government. But somehow or other, in the twentieth case something seems to go wrong with his judgment and prompts him to ignore opposing, but obstinate, facts. When the gods created him they gave him many and great gifts, but they left out an element somewhere which has to do with the control of judgment. There can be no doubt he would make a great Prime Minister, but his best friends would not be without misgiving that this cog in the intellectual machine might turn up at any time and put things wrong.

Churchill's attractive personality has prompted rather a long digression, but there is not much more that need be added on the subject of trench mortars. It was a long time before the difficulties connected with the ammunition for the Stokes guns were overcome ; but the Army had as many as they wanted from the spring of 1916. After the successful smoke attack at Loos in September, 1915, the larger 4" Stokes was mostly used for chemical shells, and the 3" type became the established pattern for artillery purposes, and was used very extensively by our Allies also. The numbers of them in the field rose to about 1,500 by the beginning of 1917, with a settled requirement of about 80,000 shells per week. About half the same number of 2" mortars proved to be a full equipment,

and their ammunition requirement was about 14,000 bombs per week.

Thanks to the good offices of Senator Humbert, a start was made in August, 1915, on the production of a heavy mortar which threw a gigantic shell, and some of which were being used by the French. The number of these enormous weapons was never great, and the limiting factor in the use of them applied also to the use of the Stokes. A ton of ammunition went no distance with the Stokes mortars, and as they had to be in or near the front line, the transport of vast masses of ammunition up to them presented real difficulties. According to a report of General Delmé Radcliffe, the capture of Goritzia by the Italians in August, 1916, was very largely due to the employment of the heavy mortars. The prisoners reported that their great projectiles had produced the most terrifying and devastating results, destroying extensive arrangements of barbed wire entanglements and other defences, throwing down parapets and burying the defenders. The Carso presented specially favourable ground for these weapons. Parapets had often to be built, and the stones of the parapet itself were transformed into flying projectiles, and the Austrian Command issued orders forbidding the building of parapets of stones or masonry.

Finally, during 1917, the 2" mortar gave way to a superior pattern in the introduction of the "Newton" 6" mortar, which afterwards became extensively supplied and adopted as the standard pattern of the Allies. It possessed great advantages because of its long range, and could be used, if necessary, from a considerable distance behind the front lines.

CHEMICAL WARFARE

A mysterious and closely guarded section of the work of the Trench Warfare Department was that of Chemical Warfare. As it developed, and as manufacture and supply came to be a huge business involving the employment of great numbers of persons, the difficulties of preserving secrecy were intensified. Notwithstanding this, from such materials as were obtained, it was evident that the Germans were by no means possessed of all our secrets, and were consequently defective in their defensive apparatus. Our War Intelligence Department was developed to an extraordinary degree of excellence, and I think we came to be better supplied with information than they were. Even in December, 1915, we were provided with a full account of what went on at their classes for officers in the great chemical factory of Beyer, at Leverkusen, near Cologne. Special courses for officers were then being held, with a preference for those who had studied chemistry. The

course consisted of eight days' theoretical and practical instruction, and we were supplied with full details of the chemical composition of what they were devising. The information given at that time also furnished details of a gas attack being prepared on a portion of the line held by the French, and it was subsequently confirmed as correct both as to the place of the attack and the character of the gases used. Being forewarned, of course appropriate defensive masks had been supplied. It may be interesting to mention also that, at a special conference on the subject in April, 1916, the Kaiser gave his consent to the use of prussic acid in gas. By that time, therefore, all restraint had been abandoned, and it had become a ghastly competition between chemists on both sides, for the preparation of gases for offensive purposes and for defensive compounds to be used in masks and otherwise. There was a partnership between the Intelligence Department and the Scientific Committees on each side. Although we had a bad start, and I write without the same fullness of material from the German side as from our own, I believe that the British scientists and intelligence officers established a marked superiority.

Nobody, however, loathed the work more than the men who had to do it. They did it out of desperate necessity to help to save the country, but it was a horrible business, and I do not think that anyone ever got over his feeling of utter repugnance to this type of warfare. We could have done nothing had it not been for the Scientific Advisory Committee, which the Royal Society and other bodies helped us to get together. Subsequently it developed into the Trench Warfare Research Department, under Jackson, and worked in close association with men, under Sir Alfred Keogh at the War Office and attached to G.H.Q. in France, with D. Walter Crossley, F.R.S., as the general go-between.

The Scientific Committee were our advisers also on many questions beside gas warfare. They helped us in the manufacture of scientific instruments, microscopical glass, chemical glass, porcelain, and in many more. They were, indeed, a General Staff on scientific questions, and at first consisted of the following gentlemen—

Major-Gen. Sir Louis Jackson, C.B., C.M.S. (Chairman).

Prof. A. W. Crossley, D.Sc., F.R.S., King's College (Secretary).

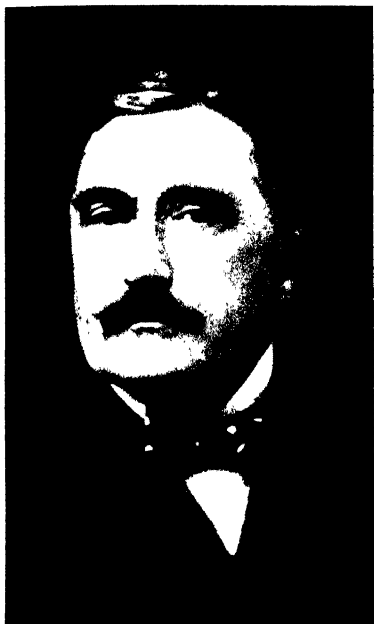
Sir B. T. Glazebrook, F.R.S., National Physical Laboratory.

W. B. Hardy, Esq., F.R.S., Cambridge.

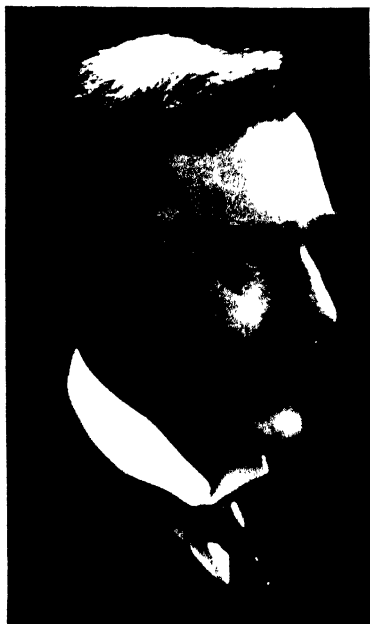
Prof. B. Hopkinson, F.R.S., Cambridge.

Prof. J. F. Thorpe, F.R.S., The Imperial College of Science and Technology.

Prof. H. B. Baker, F.R.S., The Imperial College of Science and Technology.



MR. G. S. H. F. G. A. S. R. A.



SIR R. G. D. C. K. O. B. I. R. S.



SIR WILFRED STOKES



PROF. A. W. CROSSLEY, D.Sc., F.R.S.

Sir Boverton Redwood, F.R.S.

Sir G. T. Beilby, F.R.S.

Later on, for trench warfare purposes only, they became grouped into two bodies, with the added assistance of—

Prof. J. Cadman, C.M.G.

Lieut.-Col. J. C. Matheson, R.E.

Prof. R. Threlfall, F.R.S.

Major-Gen. Sir D. O'Callaghan.

Dr. Dugald Clerk, F.R.S.

Prof. C. V. Boys, F.R.S.

Working with them we had a committee of experts on chemical manufacture, consisting of—

R. G. Perry, Esq. (Messrs. Chance & Hunt).

H. G. Glendenning, Esq. (Messrs. Brunner, Mond & Co.).

Dr. G. C. Clayton (United Alkali Co.).

A. T. Smith, Esq. (Castner-Kellner Co.).

The agents used were known under various aliases, such as Red Star, White Star, S.K., V.N., and many more, and, as the war developed the more lethal and awful they became.

Gas was first used by the British on an extensive scale on September 24, 1915. On some parts of the line the weather conditions made it unfavourable for our own men, but it appeared to be the general opinion that the capture of much of the ground in front of the Hohenzollern Redoubt was due to the surprise and effect of the gas attack. In some of the trenches little or no resistance was experienced, and in one section the German officers lost control over their men, who became panic-stricken and helpless. Colonel C. H. Foulkes told us in his Report, that some of the men who had been soldiers for only a week or two, and who had come practically straight from the laboratory to take charge of the gas apparatus, displayed remarkable coolness, although many of them were themselves seriously damaged by the gas. One brave fellow discharged eleven out of his twelve cylinders by himself. The valve of the twelfth one would not open, so he put it on to the parapet and discharged his rifle into the valve, and so liberated it. One elderly scientist was so overcome with enthusiasm that he joined the infantry assaulting columns in order to investigate the results in the German trenches. Although he was unarmed, he proudly brought back, out of a German dug-out as prisoners, a colonel, a captain, and five soldiers.

After the battle of Loos there was an increasing demand for long-distance projectiles, and for bombs and shells charged with chemicals,

and these afterwards became part of a weekly supply of "special" shells, which, in 1917, amounted to almost as many as the total issues of completed shell ammunition in June, 1915.

It is useless to spend time in scolding the Germans for the introduction of gas warfare, or in deploring the degradation of science and humanity it involved and the peril it has created for all nations. It is difficult to conceive of any international arrangements which will prevent people going on working at these problems if they have a mind to do so, for the work can be clothed with secrecy and carried out in remote and inaccessible places. Large-scale manufacture of what is required cannot, of course, be done in a corner, but it would not be difficult rapidly and secretly to use well-equipped chemical works for the production of what is required. It may well be that, in conjunction with the aeroplane, the development of chemical warfare may place small nations to a great extent on a level with larger ones, if their scientific equipment as to men and apparatus are of the first rank, for it does not need a multitude of people to engage in this class of warfare. A few might blot out a multitude.

There appear to be only two avenues of hope open to humanity in this respect. They are, first, that the development of universal repugnance towards the whole thing may lead to such a strengthening of the efforts of the League of Nations that it will be possible to devise some penalties or safeguards against the elaboration of these methods of war, and some binding and respected international agreement for the maintenance of peace. The second ground for hope is that the prospect is so full of the possibilities of horror and of the blotting out of cities and their innocent inhabitants, that nations, being impressed by the fear of what others can do by these methods against them, will, for self-preservation's sake, be willing to make an end of the ghastly business.

CHAPTER IX

THE TANK

Its Origin—Churchill's Committee—Tritton—Wilson—Work at Lincoln—The Landships Committee—Stern—D'Eyncourt—Hetherington and the Inventions Department—"Little Willie"—First Trials—New Form of Track—"Big Willie"—Instructions to Manufacture—The Trial at Hatfield—Large Orders—Use on the Somme—The Department—Stern and D'Eyncourt—Tribute to Churchill—Increased Demands and their Effect—Later Types.

THE idea of the tank arose with two different groups of men towards the end of 1914. Churchill, at the Admiralty, formed a Committee under the Chairmanship of Sir Eustace Tennyson D'Eyncourt, with Major W. G. Wilson as the Chief Technical Expert, to consider the problem of crossing trenches by a machine which had both offensive and defensive properties. This was known as the Landships Committee.

At the same time, Sir William Tritton, the Managing Director of William Foster & Co., Ltd., of Lincoln, who were constructing tractors to carry the big naval guns on land, was asked by Admiral Bacon, of the Admiralty, to consider the possibility of constructing a tractor that would be capable of laying its own bridge so as to cross trenches. Bacon added the suggestion that it would be of value in trench warfare if the tractor could be equipped with means of offence and defence.

Acting on this suggestion, Tritton and his colleagues constructed an elongated tractor that carried a movable bridge capable of being dropped so as to enable the tractor to cross an eight-foot gap. During April, 1915, the Landships Committee paid a visit to Foster's works to inspect this "bridge tractor," with the result that Wilson was appointed on behalf of the Landships Committee to work with Tritton. Subsequently, they were officially instructed "to design a machine, strongly armoured, carrying powerful guns, capable of negotiating all reasonable impediments of the battle area and of crossing the opposing trenches."

In August, 1915, Balfour, who was then First Lord of the Admiralty, did not take kindly to "Winston's fad," and the officers and men attached to it were transferred to the Ministry

of Munitions. We did not regard it as a "fad." The preliminary arrangements for the transfer were made at a conference I held on August 9, with Sir Albert Stern, Secretary, and Major Hetherington, of the R.N.A.S., on behalf of the Landships Committee, Jackson and Roger from our own Trench Warfare Department, and Moir and Mr. Hutchins from the Munitions Inventions Department. Subsequently, at the invitation of Colonel E. D. Swinton, as Secretary of the Committee of Imperial Defence, the formal arrangements were concluded for our dealing with what were then styled "land cruisers or armoured caterpillar motor cars."

In this way the Landships Organisation became associated, without interfering with their own constitution, with the Munitions Inventions Department, under the presidency of Moir. Hetherington, with No. 20 Squadron R.N.A.S.—strengthened by the addition of a number of skilled artificers, drivers, machine-gunners and others—took charge of experimental work at the Trench Warfare Department's ground at Wembley. The arrangement was that if and when landships became a manufacturing proposition, they would constitute another supply department of the Ministry.

Previous to this, the first tank, known as "Little Willie," was begun in Foster's works on the united designs of Tritton and Wilson, and they produced a machine by September 8 which proved that the problem was on the way to solution, although a new form of track appeared to be required. The trial of this machine on September 19 was really the first formal tank trial. Apart from Tritton, Wilson and their colleagues, it was witnessed by D'Eyncourt, Moir, Swinton, Hetherington, and Lieutenant Symes, of the R.N.A.S.

"Little Willie" moved by a track running round a low projection on each side, and carried a trailer behind; but as a result of the trial, Tritton designed the form of track which was afterwards used on all the tanks. The Admiralty men who were working on the subject were also giving much thought to the form of the track, and had come to the conclusion (as Tritton had independently) that the previous form of track (Balata belting) was unacceptable and, on September 21, Symes was sent down to Lincoln to give the results of their experiments. It so happened that Tritton had already become convinced of the utility of his alternative form of track and of the unsuitability of the material previously used, and sent the following amusing telegram to the Admiralty announcing the result on the day that Symes was sent down—

"Balata died on test bench yesterday morning. New arrival by Tritton out of Pressed Plate. Light in weight but very strong. All doing well thank you. Proud Parents."

The new form of track was fitted on to "Little Willie," but there were still difficulties. The final solution resulted from a suggestion by Wilson that the track should be carried all round the machine on each side, enabling the use of a forwardly projecting nose for climbing, and giving better accommodation for the guns. The result was that "Big Willie," eventually re-christened "Mother," was decided upon, and proved to be the first successful tank. There were some satisfactory exhibits of the model of "Big Willie" at Wembley on our experimental ground, and at the end of September Stern, the indefatigable Secretary of the Landships Committee, instructed Tritton with all possible speed to construct a machine on the lines of the model exhibited.

The building of the machine was begun on October 28, and by January 6, 1916, the first tank capable of moving out of the works under her own power was produced. She was first tried by Foster's on January 13, in Poppleton's field, a short distance from their works, and was driven, in turn, not only by the firm's own enthusiastic driver (Mr. C. Maughan), but by Stern, Wilson, Hetherington and Symes. She easily accomplished the prescribed test—which was to cross a trench 5 ft. wide and surmount a parapet 4 ft. 6 in. high—and ploughed her way through walls, hedges, and barbed wire with complete indifference and success. A full official trial was accordingly arranged to take place in Hatfield Park.

The preservation of secrecy from the beginning was a vital matter, and in Foster's works, where concealment was impossible, the very sensible plan was adopted of encouraging the jokes that were current as to the latest "crank" of the Chief, and it was quite accepted that for once Tritton had "a bee in his bonnet." I do not know who conceived the idea of keeping it secret by regarding it as a joke; perhaps it grew up in the works, but it was a brilliant notion. So far as those few of us at the Ministry were concerned, who knew anything about it, every care was taken to keep it secret, and even for a long time after it became a great manufacturing proposition it was kept out of our Secret Weekly Reports.

The trials at Hatfield removed any doubts as to the vast possibilities of the invention. There were two trials: one on Saturday, January 29, 1916, and the other on Wednesday, February 2, the latter being witnessed by a big gathering of officials, including Kitchener, Lloyd George, Balfour, McKenna, and many others. I myself saw it on Saturday, the 29th, and my note of the event is in the following terms, as made on the following day—

"On Saturday morning Kellaway and I were called for at 8.15 and were motored to Hatfield in order to witness a highly secret performance of the new Land Cruiser, and a wonderful performance it was. It went straight

over a 5-ft. parapet and across a 5-ft. trench with a bank on the other side without any hesitation ; it crushed through barbed wire as if it were cotton, and then surmounted a deep ditch and a shell-hole 12 ft. in diameter. They tried to push it through a wet marshy place with a parapet at the end, but it stuck for a time. Finally, however, by feeding it, under the track, with railway sleepers and other appropriate morsels, it surmounted the slippery clay parapet 5 ft. high and dragged itself out. A fleet of these things would probably suffer a good many casualties, but I should think that the first time they were used they would be instrumental in breaking down a large length of front."

An amusing incident occurred in connection with this first trial of the tanks at Hatfield. On the Thursday night I was rung up by a justly renowned General at the War Office who wanted to know if I could tell him, " Who the Hell was responsible for what was happening at Hatfield ? " My reply was that I did not know that anything was happening, but anyhow, they had undertaken to guard the place and all its approaches, and what was it that was happening ? It appeared that the dummy tank, covered with tarpaulin, had arrived on the scene of action, and, whilst this thing was there, for some reason which neither he nor I ever divined, there was a species of parade of Special Constables over the adjoining ground. Luckily the thing covered with tarpaulin looked like a transport wagon and attracted no attention. Very soon the whole place was ringed round with armed sentries, and, fortunately, the genuine tank did not arrive at Hatfield until midnight the same evening. It was carried by the Great Northern Railway, and the loading at Lincoln and the unloading at Hatfield were done very secretly. All the adjoining roads were closed, and the tenants of the houses at Hatfield on the line of route had instructions to lower their blinds and not to enquire into the cause of any noise which they might hear outside in the early hours of the winter morning. So far as one was able to learn, the secret did not leak out and the potentialities of the tank remained known only to a few.

Immediately after this trial an order was given for twenty-five similar machines to be built, and a few days later the order was increased to 150. The Army Council promptly wrote to the Admiralty expressing their gratitude at the successful trials, and especially to Tritton, Wilson and D'Eyncourt.

Before the end of August, 1916, the demand for tanks had risen to 250, and on September 26, ten days after the first tanks came into action, an additional thousand were ordered.

On the previous Tuesday, September 21st, I had summarised the position in my diary thus—

" The ' tanks ' appear to have made a great impression both on our own men and on the Germans when they were used for the first time last

Friday on the Somme. I have kept even the mention of them out of this diary, except for the Hatfield performance, as we felt that nothing but the profoundest secrecy should be allowed in respect of them. The trial I attended about last Christmas in Hatfield Park was of the first fully completed tank. The story of them is that Tritton, of Foster's, Lincoln, and Wilson, of the R.N.A.S., and others, with Winston's blessing, at first independently, and then together, had experimented on the Land Cruiser—as they were called—whilst Winston was at the Admiralty. Balfour did not want to be responsible for Winston's fads, so that when Winston left the Admiralty this squad belonged to nobody. Jackson and our Trench Warfare people had at the same time been experimenting with a similar caterpillar for carrying flame projectors, and at Wembley last autumn we decided to take the tank squad which were then enrolled in the R.N.A.S. into our keeping. We provided them with experimental ground and finally found them a home in the Hotel Metropole. After the trial, when the tank had demonstrated its obvious capabilities, L. G. told Stern and company and the tank squad to get ahead, although, as a matter of fact, we had previously instructed them to make provision for turning out at least 100. We called it 'tank' to hide its nature, and I do not think it has leaked out, although in Foster's shops where we have had the vital parts made, they must have had a pretty clear notion of what was in hand. Both workmen and firms have, I am sure, kept their counsel magnificently. Outside the tank squad themselves, I think there were very few in the Ministry itself who knew about them. Anyhow, we got seventy-five of them out to France some time ago, and Haig insisted on giving fifty of them a trial the other day. We are getting on with 250 of them and shall soon have a bigger number out there. I fully expect, however, that they will now want a 1,000 or something of that kind, and how we are to get them made I scarcely know. Stern is not back from the Front yet, but I shall tell him, unless Montagu objects, which I don't think he will, to get ahead with his plans. The requisition for more will come before long.

"One cannot wonder that they have been the subject of laughter. The tank looks more like a mighty toad than anything else, and the leisurely way in which it pushes its way along with a sort of exquisite languidity, and will stop on the top of a parapet or over a trench, and proceed backwards or forwards as may be wanted, raises a queer feeling which is a mixture of laughter and dread. I don't wonder that our Tommies laughed when they found them on their side and the Germans in many places surrendered pretty freely to them."

All the men who had had much to do with the development of the tanks deprecated their use in small numbers and over ground torn up with bombardment. But the Headquarters Staff was a long time coming round to their view as to the proper way of using them. The use of tanks over the swampy, impassable ground around Paschendale provided a dramatic illustration of the wrong way to use them, and the final justification of the view the tank men put forward—that they should be used in large numbers, over ground not hammered to pieces by long, furious bombardment and beset with swamps—was provided by the rapid break-through at Cambrai.

During the latter half of 1916, and until June, 1917, the chief official questions affecting the supply side of tanks fell to my lot, and it was no easy business sometimes, with one man clamouring for an order for the highest grade of priority, say for guns for merchant ships; another for tractor transport, Stern for tanks, and so on—all strong, bustling, capable men—to keep the peace or to make such adjustments as kept the business running smoothly. I am sure that both Tritton and Wilson, as the inventors, and D'Eyncourt as a wise adviser, will readily acknowledge that Stern deserves a great measure of credit for the successful production of the great fleets of tanks which were afterwards put into the field.

The demand for tanks soon increased beyond the first considerable order of a thousand. They were difficult things to supply, and, as time went on, their gun equipment alone greatly added to the task of those responsible for the supply of machine-guns and the lighter guns required for the defence of merchant shipping.

In addition to this, as the experiences of the tanks increased, a number of modifications and improvements were suggested, and all of them added to the difficulty of production. Indeed, towards the end of November, 1916, two months after the order for the thousand had been given, a long list of important alterations was called for in the tanks already ordered. The worst was, that all this meant much additional skilled labour at a time when the recruiting officers were squeezing our labour supplies more and more. So much was this the case that, after we had made an arrangement with Haig, Wigham, Davidson and the other generals for the increased supplies, Montagu, who was then Minister, wrote formally to the War Office pointing out that the new order alone necessitated the employment of 3,000 additional men, of whom at least 1,500 must be skilled workmen, and that he "felt himself unable to hold out any hope of meeting the large programmes that had been put before him unless he could secure the support, not only of the War Office, but of the recruiting officers throughout the country, in protecting the labour staff of firms manufacturing very urgent war material."

This case affords a good example of the perpetual labour difficulties with which we were confronted. All the time we were between the upper millstone of increased supply demands and the nether millstone of increased man-power demands. In February, 1917, when I myself was Minister, Stern supplied me with detailed lists of the skilled workers still required on the Tank Programme. It amounted to 2,169 men and comprised thirty-six different varieties of skilled workmen, and only went to show that tank

supply was involved in the same difficulties that we had to contend with in other departments. The demands for the machines were first represented by tens, then became hundreds, and finally thousands, although the drafts on man-power by recruiting officers grew greater all the time.

A lighter and speedier variety of tank, known as the "Whippet," came into action in considerable numbers at Villers-Brittonneux, on March 26, 1918, and rendered conspicuous service in breaking up the German forces along the ridge which runs from that place to Hangar Wood. More "Whippets" were therefore wanted with a further crop of labour and workshop difficulties. But the manufacturing side of the story need not be developed. The department made good with tanks as with other things, but a concluding note on some of the men concerned is called for.

The merit of Tritton and Wilson, as the main inventors, cannot, I think, be challenged. Tritton also was responsible for the "Whippet," as well as for the design of a further important tank known as the "Hornet."

Tennyson D'Eyncourt was Director of Naval Construction, but found time to help us at Munitions in the Tank Supply Department. His work affords one of the best examples of practical and sensible departmental co-operation that I know of. But, just as it was with the Stokes gun, so with the tanks: it is doubtful whether this invention would have fully come into its kingdom had it not secured enthusiastic official support. Churchill was in and out continually, whenever he was at home, with solicitudes for tanks uppermost, and he deserves a considerable share of the credit for the success that was achieved. It was a case in which his enthusiasm and imagination had the best possible scope. Lloyd George and myself at Munitions, in our capacity as Director and Assistant Director of the most magnificent engineering business in the world, did no more than take good care that all our facilities were at the tank's disposal, but the one man in the official world that stood out as the tank champion was the indefatigable and restless Stern. Anything which came in his way was "red tape." The claims of anyone else for permits for machinery or materials for machine-guns, guns, transport, or for anything except tanks—although it might have been given as high a class of priority—was just an absurd stumbling-block that it was the business of the Minister, on Stern's request, to remove forthwith. Although Stern was officially a 'supply' man, he was wise enough to resist the premature employment of tanks. Although, I dare say, he was sometimes a thorn in the flesh, he maintained excellent relations with the splendid staff which the

War Office and Haig got together for dealing with tank questions ; indeed, I think he had considerable influence in their counsels when determining the technical and strategical considerations applied to their use.

Altogether there was no section of supply that gave us more joy than tanks. It was not only their novelty and their success that were stimulating. They brought into our midst a group of bright and eager spirits, tireless and ingenious, who were an encouragement and a refreshment—an embodiment of the great comradeship of those days.

CHAPTER X

STEEL AND OTHER METALS

The Demands for Steel—Pressure upon Domestic Supplies—War Extensions—Work of Hunter—Weakness of the British Position—Priority Systems—Wormald's Committee and Civil Industries—Supreme Cabinet Committee under Smuts—Salvage—Work of Fielding's Committee—Work of Alexander Walker—The Enemy's Position.

IT would be wearisome to describe the difficulties that arose in obtaining materials for the vast programme of munition manufacture, but even at some risk of interrupting the general narrative it is necessary to refer to them, for they revealed in striking fashion the strength, and some of the weaknesses, of British industry.

Two groups may be taken as examples—steel and allied materials, and explosives.

The obtaining of steel provided a demonstration of the greatest weakness of our industrial position—after the insufficient use of our own land for food production and timber growing. The indications, unfortunately, are that the painful lessons of those days are being forgotten.

Steel was required for shipbuilding, for munitions and for many other war purposes, as well as for the conduct of a great variety of national industries. The demands grew rapidly as the war developed, but, unfortunately, the manufacture of steel made the heaviest demands of any upon our importing capacity, after grain and timber. The reason was that many of the steel-works were dependent upon the importation of iron-ore from Spain and Scandinavia; they had been built to deal with these richer "hematite" ores, and in the year before the war had called for the importation of nearly 7,000,000 tons of them. Importation was a prodigious drawback in a time when shipping was scarce and navigation dangerous, and during 1917 we had to choose sometimes between bread and iron-ore, for we could not have both in the quantities required. The demands of the war services for steel were resistless, and they were at their maximum when our shipping difficulties were the greatest. We were compelled to continue an enormous importation of ore, although

this country is supplied with deposits of iron-ore as extensive, perhaps, as those of any other country of equal size in the world.

How did the situation develop, and what were the steps taken to deal with it ?

At the beginning of the war the British steel production was about 7,500,000 tons per annum, and there had been a domestic consumption of some 5,000,000 tons. There was, of course, a valuable export trade in steel, in the form of machinery, railway material and otherwise, and our production had been supplemented by importation of steel from abroad ; but both these two latter factors increasingly ceased to operate during the war, and the governing influences were our home output on the one side, and the steel requirements of war and other services on the other.

It was not long before the ordinary home demand was augmented by a far greater war demand, and there was not enough to go round. The drain upon home production was mitigated by supplies of finished shells drawn from Canada and the United States, but these did not sensibly diminish the overwhelming need, first, for producing more steel from our native ores, and, second, for exercising the strictest economy in the use of what steel there was. Our efforts required to be concentrated on these two main purposes.

The task before us will be appreciated by a glance at the figures of the demands of the war services as they had developed even by the end of the year 1916. Our French Allies had been deprived of a large proportion of their steel-works, so that shell steel for France became part and parcel of our weekly programme. Our own munition demand for shell steel in June, 1915, had amounted to only 4,000 tons per week, but the output required in December, 1916, including the contribution to France, was 42,000 tons per week. Merchant shipbuilding and Admiralty work at that time required an additional 26,000 tons, although the merchant shipbuilding programme was then not half as great as it came to be during 1917. During the autumn of 1916, also, Geddes, who had been placed in charge of railway provision in France and elsewhere, sent in a comprehensive demand. Geddes never failed by asking for too little, and when his requests were analysed out, it appeared that Moir, who had then been placed in charge of railway material production, was required to find more than a thousand miles of railway track, with a corresponding demand for rolling stock, of which an item for 26,000 railway wagons was not the most insignificant. Altogether, after allowing the barest ration only for home railways, and after pulling up and sending abroad any suitable lines that could be spared, an additional 400,000 tons of

steel were required for railway material. At this period, also, the demands of the Trench Warfare Department and for tanks amounted to 80,000 tons per annum each. These five groups of demands alone represented nearly as much steel as had been used altogether before the war for domestic purposes, and there were, of course, multitudes of necessities beyond them, for they did not leave an ounce over for machinery, agricultural implements, guns, special steel and a hundred other industries.

In the winter of 1915-16 vast additional steel-works were planned, and their construction was placed under the charge of Sir John Hunter, who came to us from Sir William Arrol & Company. Hunter and his men had to confront every imaginable difficulty. There was an increasing scarcity of labour to build the new works, and still more for the conduct of the works and for the extensive mining and quarrying of iron-ore, coal and limestone that were involved. Again and again we seemed to reach an *impasse*, but by one device or another the difficulty was met. It would be hopeless to particularise amongst the men who helped us; the issue of the war almost depended upon their success, and their relentless work and unquenchable zeal marked their recognition of the fact.¹

The ultimate result was that in 1918 there was an increased home production of about 2,000,000 tons of steel. This may seem but a small increase to those who are unacquainted with what it involved. But Hunter and the Association of the Steel Manufacturers expressed themselves as gratified at the rapidity of the progress made. It furnished an illustration of what would really be involved if our steel and iron industries were to be developed in any way comparable to that which has taken place in Germany and in America during the last generation. Our own "basic" iron-ore is of the same type as that on which the great developments of the German steel trade have been founded, and there is only one substantial source of the richer "hematite" ore in Britain; namely in Cumberland. We did our utmost to increase the output of Cumberland ore, but all we could do went but a small way to diminish our dependence on importation. Moreover, the increases of steel production from our own basic ores did not make us much less dependent upon overseas supplies of ore; they sufficed to meet the extra war demands, and that is about all. It would be too technical, and perhaps wearisome, to examine this great endeavour much more closely. There is no problem of British industry more worthy of concentrated attention and more vital

¹ A list of the chief officers in Hunter's Steel Department is given in the Appendix, No. 4.

to our future prosperity than the insufficient use of our own abundant iron-ore deposits in the production of steel.

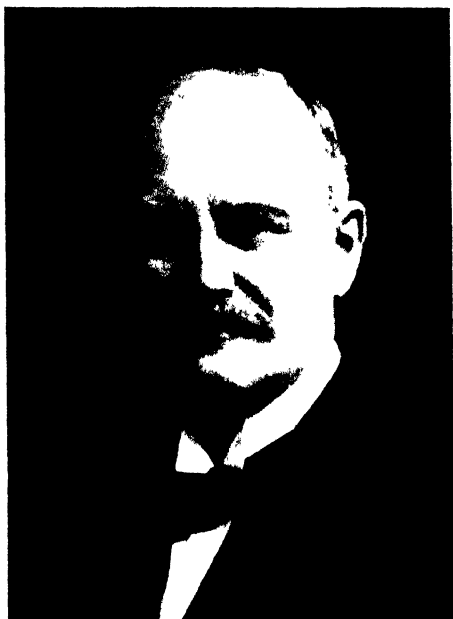
It was remarkable on the whole that, notwithstanding the submarine campaign and the limitation of imports from the beginning of 1917 onwards, we were able to increase the steel production as we did. The methods adopted prompted an improved organisation in the trade itself and a great development of coke-oven and recovery plants, and these additions to our industrial equipment are continuing assets.

The work brought a crop of difficulties that admirably illustrated the complexity and the world-wide involvements of British trade. For example, the attitude of King Constantine was an important factor, although, perhaps, he himself was unaware of it, and an extract from a letter I wrote to Lloyd George, as Prime Minister, on December 13, 1916, may be quoted as displaying it. Referring to affairs in Greece, it said —

" I think I ought to draw your immediate attention to the serious position which may be created with regard to our supplies of ' magnesite ' by events in Greece. Almost the whole of our supply comes at present from mines on the island of Euobœa and is shipped from ports on the western side of the island. Should we lose control of the mines, or free access to and use of the ports, the position with regard to our supplies will be most serious. The extension of steel-works in progress and the conversion of acid (hematite) furnaces into basic furnaces in consequence of the shortage of hematite ore necessitate a very largely increased consumption of magnesite for which existing stocks are inadequate, and which the supplies already arranged for, even if not curtailed, will be barely sufficient to meet."

The steel scarcity soon led to a pooling of demands and to joint arrangements for apportionment amongst those requiring it, and the business was transacted in the Steel Department of the Ministry of Munitions. In the same way the scarcity compelled us to develop a complete system of control over every ounce of steel, and of most other metals. Not only must we secure that people did not obtain more than they really required, but those who required it most must obtain precedence. This led to the creation of a Priority Department, in which all demands were pooled, and I think Sir Charles Stewart-Wilson, the Chairman, and Sir Edgar Jones, M.P., who was the managing head of the section, had one of the most thankless and difficult tasks of any body of men during the war. This Priority Agency was the first amongst those whose business it was to secure economy in the use of materials.

As the threats of the submarine campaign grew more ominous at the beginning of the year 1917, it began to be a question as to whether there would be anything at all to distribute to general industry apart from the war services. War departments wanted



SIR JOHN HUNTER



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SIR J. WORMALD



SIR ALEXANDER WALKER

everything, and some of us began to be very anxious as to the ultimate effect of this starvation upon the recuperative capacity of many important industries.

On becoming Minister in January, 1917, I took counsel with a number of our business men on this point, and found ample evidence of the dangers. We ought to do what we could to enable essential industries to retain capacity for reasonably rapid recovery. Accordingly, in February, 1917, I asked Sir John Wormald, of Messrs. Mather & Platt, who was already helping us in the commercial engineering side of our work, to take special charge of this matter, and I appointed him chairman of a Priority Advisory Committee "for the purpose of investigating the cases of industries threatened with extinction owing to the failure or shortage of supplies of raw materials, to take evidence from associations of the trade threatened with extinction, and to advise the Controller of Priority."

Wormald's colleagues were—

Sir Archibald Denny, of Dumbarton.

Mr. Henry Woodall, of the Gas Light & Coke Co.

Sir Alexander Walker, of John Walker & Co.

Mr. Kenneth N. Chance, of Chance & Hunt's.

Mr. George Alexander, from the Federation of British Industries.

Mr. J. M. Keynes, of the Treasury.

Later on, Professor Clapham, from King's College, Cambridge, who was helping the Board of Trade, and Mr. Murray Walker, joined them.

These gentlemen originated arrangements in the different industries of the country whereby the whole facts were examined with responsible representatives of the manufacturers, and they developed a system whereby such a bulk ration as could be spared was issued to the trades representatives, who in turn dealt it out to the industry on an agreed basis.

By the end of 1917 the struggles for materials between War Departments themselves, and even between sections of the Departments, had become so acute, and outside industries were being so squeezed out of existence, that the War Cabinet itself appointed a final determining authority. It was known as the War Cabinet Priority Committee, and General Smuts was appointed Chairman. Wormald's Committee, representing civil industries, was associated with Smuts and reported to myself, who had then become Minister of Reconstruction. It is difficult to speak with certainty, but the records that Wormald and his colleagues provided of the precarious position of many industries and of the importance to them of the preservation of a small ration of material convinced me that had it

not been for the far-sighted and business-like operations of his Committee some most important industries would have become so deprived of recuperative power that their recovery after the war would have been jeopardised for a long period.

None of these arrangements, however, would have sufficed to see us through our difficulties had it not been for three other efforts. First, the operations of the Salvage Department of the Army in France returned immense quantities of scrap of every imaginable kind. Whenever we notified them, say, that six months hence the position in regard to this metal or that would be particularly difficult, they rallied to our assistance magnificently, and only those who went into the details of the business can imagine how precious a great many odds and ends became and how helpful were the collections of cartridge cases, of copper, aluminium, brass and other metals.

The second great contribution was made by a body of men called the Metals and Materials Economy Committee, presided over by Sir Charles Fielding, of the Rio Tinto Corporation. Fielding is a man with a big vision and immense knowledge, and many talks with him and Sir Cecil Budd on metal and on tonnage questions, as well as on the possible developments of the mineral resources of different parts of the Empire, remain fixed in my mind as some of the most informing and attractive of the many that it was my duty to have. Fielding made some suggestions which I asked him to develop; and the result was that, in November, 1916, I submitted to Montagu (then Minister of Munitions) a scheme of work. The labours of Fielding and his colleagues were collectively so important that, by June, 1917, they had secured economies in expenditure on metals to the extent of £12,000,000 worth on the year's programme. The Committee was formed of Heads of Departments with experts added: there was Bingham, who had then become our Director-General of Design, and Goold-Adams from Inventions, with Moir, West and Walker, with Captain T. G. Tullock from the Materials Department and Prof. F. W. Harbord their metallurgical expert, with Sir G. T. Buckham, as an authority on Design from Messrs. Vickers, and Mr. H. Mensforth. Llewelyn's Materials Department and the manufacturing branches were the instruments of the Committee, as well as the Ordnance Department. Bingham was happily instrumental in removing all trace of the stickiness which used to trouble us so much in early days, and he brought the whole subject of design into active working sympathy with supply.

Nothing was too small and nothing could be too great for Fielding's Committee to look into. The making of shells or fuses

out of cast-iron opened up great possibilities of saving ; but pieces of percussion plugs, parts of detonators, tips of rifle cartridges, and the use of every ounce of aluminium and other scarce commodities provided them with a volume of labour and experiment that was most fruitful. The substitution of a fibrous material for aluminium on the tip of rifle cartridges, for instance, was equivalent to a saving of thirty tons of precious aluminium per week, and the copper saving they achieved by cutting down the bands of shells amounted to many thousands of tons. In every direction we were continually coming across difficulties arising out of some inequality in the balance of industrial processes in this country. The conquest of German South-West Africa should have given us substantial assistance with our copper supplies, and no doubt it did so indirectly, but the capacities for refining copper in this country are so limited that it was necessary to send the material across the Atlantic to the American refineries and bring it back again before we could use it. Early in 1916 the producers of zinc ore in this country were selling their material to the smelters at a price which should have provided us with spelter at £42 a ton, but the price was £100 per ton. The reason was, owing to the shortage of our domestic smelting capacity, the price of spelter was governed by the output in the United States.

The third substantial contribution to our metal economies was made by organisations that were got together under Sir Alexander Walker for the collection of scrap and for the making up of the salvage material from the war areas. Llewelyn and Budd in the Materials Department, as well as Colonel J. F. H. Carmichael, the Assistant Director, had been constantly pointing out the necessity of making an increased use of the mountains of scrap that were being accumulated at the different works. Lysaght was emphatic on the help its utilisation would give in spelter supplies ; and Mr. R. Rucker, the Chairman of the Copper Committee, said the same, as did Colonel A. J. Foster concerning antimony and lead. The difficulty all the time was, how could it be done ?

The accumulation of these mountains of material was a nuisance to Glyn-West and to manufacturers, but the collection, sorting and treating of them was altogether outside the capacity of any individual firm. Moreover, some of it involved much experiment as well as modifications of existing methods of manufacture. Shortly after my appointment as Minister I decided to create an organisation to devise some method for dealing with this waste. The men concerned spent many hours with the Rt. Hon. Sir Laming Worthington-Evans (who was then Under-Secretary) in discussing ways and means, and finally I appointed Alexander Walker to take charge of the work.

Walker knew little about scrap metals, but he had no prejudices and had a genius for management. His appointment was one of the most successful I ever made. He had to arrange for the collection and bringing into compact form of these piles of steel and copper shavings, brass scraps and other odds and ends, and to arrange for their utilisation. When it is realised that every process of manufacture throws off a proportion of scrap, or swarf, up to 50 per cent. in some cases, it will be appreciated to what an extent material had accumulated and how the utilisation of it would help, if the right methods could be devised.

In the first year of war, and in the desire to hasten production to the utmost, scrap was thrown out indiscriminately. In one dump at Woolwich a heap of metals to the value of £500,000 had accumulated, and was still being added to. Nobody wanted to use it if they could get virgin metal.

One of the chief difficulties was that the standard of quality could not be attained if scrap were used beyond a certain proportion. The transport and handling also of these prickly and tangled metal turnings were difficult and disliked by the employees. Altogether the problem of using this scrap was not easy of solution, and nobody was anxious to tackle it. Walker protested at the complexity and magnitude of the task, but he undertook it and mastered it, and with a very small staff. Whilst it was necessary to frame regulations as to prices and other matters, and to take full power to deal with any cases of misuse or refusal to obey the orders of the Ministry, the regulations were practically never transgressed.

The producers of scrap, the users and the merchants were appealed to, and Walker brought them into his scheme. Opportunity was taken at the meetings of the Engineers and Smelters, and at the District meetings, to explain the position and the necessity for action. Experiments were made in every direction to discover methods of using higher proportions of scrap in the melts, and within a year the accumulations were declining and by the close of the war there was little or no scrap left in the country. Walker was always paying tributes to his staff and to the smelters, and in particular to the work of Mr. Jewell, of Birmingham, who dealt with non-ferrous metal scrap. Walker also tells me that another Birmingham man—Mr. Walter of the Gas Department laboratory—after innumerable experiments was able to make use of old tin cans and sheet cuttings to such an extent that they yielded over 100,000 tons of steel and 1,000 tons of tin during the last year of the war.

In working up the Army Salvage that was returned to us, Walker was assisted by Captain Greer, and we provided two large factories

to deal with the material. One was at Dagenham Dock, on the Thames, and the other at Newport, South Wales, and there were sorting dumps at Hull, Newcastle, Avonmouth, etc. Cartridge cases were perhaps the most valuable of this mass of salvaged material: they had cost from 7s. to 10s. each new, but they were repaired and re-used as often sometimes as from five to eight times. At first the repair cost was 7d. each, but it was finally brought down to 3d. The repair factories were museums of ingenious contrivances to save labour handling and for the different processes of repair and restoration. We were able to do the work at lower costs than private contractors, even after allowing for interest and depreciation of building and plant on a liberal basis. But this record would not have been established if Greer had not had the advantage at both of the factories of managers of special alertness and experience. I do not know how much in material the Scrap and Salvage Departments ultimately saved us, but it must be true that as a collector of scrap, Walker probably has no parallel in the history of industry.

Finally—and most important—there was the vital fact that the people of this country were willing to go without things. It was difficult to get a leaky tap repaired, or a new piece of lead piping, or even the most ordinary and important domestic essential replaced; but people tolerated these things without complaint. In its sum, perhaps, this was the greatest contribution of all to the end product of all our efforts that the men at the front should lack nothing. But no tribute that we can pay can be worthy of the sailors who, week in, week out, through month after month to the very last day of the war, brought their ships laden with ore through seas that were infested with enemy submarines. Theirs was an ever-present danger. The shifts and devices that they resorted to to bring their precious cargoes safe to our shores were unknown to us and made nothing of by them, but these heroic men were indispensable from first to last.

Our own difficulties in the supply of materials were mainly those of shipping and the risk of loss by submarine. The enemy's experts must have known of our difficulties and their submarines did their worst, but whether from lack of knowledge or opportunity, they often missed occasions to hit us in vital places.¹

The Germans and Austrians, on the other hand, were confined to what they had in stock at the beginning of the war, or to what they could develop in the territories under their control or obtain

¹ As an illustration of our dependence on shipping, a list is given in the Appendix (No. 5) of the materials required in some stage or other of the manufacture of a complete round of 18-pounder ammunition.

from Scandinavian countries or by leakages through the blockade. The Blockade Department under Lord Robert Cecil subsequently stopped up most of the leakages, but in the early days of the war the Germans probably obtained considerable supplies of scarcer and less bulky commodities. Such information as we had however—and it was often very detailed and complete—never gave us the grounds for satisfaction which some publicists displayed to the substantial encouragement of our fellow-countrymen.

Sanguine reports of our own progress or of the enemy's losses or disabilities were helpful, and a good case perhaps may be made out for this kind of publicity, but if we were to collect together some of the reports, they would have led us to suppose that by the end of the second year of the war, or so, the Germans could scarcely have had any copper left. In the same way, if we had added up the appalling casualties that some commentators alleged the enemy sustained we could only have wondered where the men came from that formed the German armies during the last year or two of the war. There is no sense in being dismal or in making things worse than they are, but for my part I always took the view that it was better to give the people—knowing the grit and staying power of our race—something not quite so rosy in its character and more nearly in accordance with the unpleasant truth. It was common to meet people during the closing periods of the war who were suffering the inevitable reaction of disappointment as they realised, after all, that the enemy's armies were continuing to be immensely strong both in men and material. I remember discussing with Lloyd George the *pros* and *cons* of this matter before he delivered his "Too Late" speech in the House of Commons on Monday, December 20, 1915, and agreeing with him that it was good policy to try to bring home to the people something more of the grim realities of the case.

So far as metal supplies were concerned a scarcity of copper used to figure most commonly in the reports. Whether the German importation of copper before the war was connected with their warlike intentions or not I cannot say, but the fact is that for five years previously the average annual import of copper into Germany and Austria had been about 200,000 tons, and this, added to their home production of about 40,000 tons, left them with a surplus of at least 130,000 tons annually over what they used for domestic purposes. They must therefore have accumulated an immense reserve of copper, whether in manufactured forms or otherwise, and their own resources were supplemented by the output of the Serbian mines at Bor. So far as our calculations went, the reported copper famine never had any very substantial basis. There was

no shortage of aluminium, and their supplies were augmented by the development of the Austrian bauxite deposits in the Carso and other deposits in the Vogelsberg. The enemy had plenty of lead and zinc, and to a considerable extent they found alternatives for the antimony used in shrapnel bullets, although of this they were certainly short. Their output of tin was trifling, but comparatively little of it was essential in munitions. Their most difficult supply probably was the nickel required for certain types of steel, but even here their home output was substantially increased and their stocks were eked out with great skill. They also developed Salvage and the re-use of material with characteristic German efficiency, and I cannot remember that at any time any of our experts expressed the view that a shortage of material would compel the enemy to desist, although they were crippled in many directions and were increasingly unequal to the united capacity of the Allies, after America had brought her immense resources to our aid.

CHAPTER XI

EXPLOSIVES

Domestic Necessities Affected—The Programme—Moulton's Estimate—Sulphuric Acid—Altered Type of Home Production—The Trade—Shortt's Committee—Necessity for a New High Explosive—Moulton and the Artillerymen—Chetwynd—Glycerine—The Price of Soap—Cordite and Tonnage—Dependence on America—Alcohol and the Distillers—Yeast—Local Customs—Montagu and Propellant Supplies.

FEW things affected the domestic life of the people in a greater variety of ways, although often by very indirect and roundabout routes, than the steps we had to take in order to obtain materials for explosives. The supplies and prices of margarine, soap, and candles depended upon them, and a good many people who were lucky enough, on some doctor's prescription, to obtain a few ounces of glycerine realised for the first time how precious a commodity was that ancient remedy for "chapped" hands and how wonderfully far an ounce or two could be made to go if used with care. The necessities which restricted soap, margarine and glycerine were equally responsible for the short supplies and high prices of cattle cake and many animal feeding-stuffs. In a similar way the diversion of sulphuric acid to explosive manufacture, until the new factories provided their full output, affected a host of commodities and trade processes in the textile, paper, paint, leather and other trades, and limited bleaching powder and mineral waters, as well as supplies of the artificial manures that were more wanted by the farmer at that time than ever before. The taking over of the distilleries was not directly felt by the public because some years have to pass before much of the spirit produced in them is used for consumption, although a vast number of trade processes that required alcohol were compelled to go short. At the height of the submarine campaign the supplies would have been shorter still had we not been compelled to keep some distilleries working in order to obtain the domestic yeast they produced at the same time as the alcohol. Householders who complained of their gas, whether for lighting or heating purposes, were in reality

suffering these deprivations because of the demands of the explosive programme.

In July, 1915, the amount of explosives required for the gun-ammunition programme was about 400 tons per week, but by the beginning of 1917 it had mounted up to about 7,000 tons per week.

The explosives were of two kinds: those which burst the shell—High Explosives—and those, filled into the cartridge case, to obtain discharge from the gun—Propellent Explosives.

In September, 1916, Moulton estimated that our ultimate requirements of high explosives alone would reach 6,000 tons per week, and of propellants about 4,000. His estimate of high-explosive requirements, however, was somewhat excessive and the full amount was never required or produced.

Both kinds of explosives made demands upon supplies of strong sulphuric acid and, collectively, much beyond the previous productive capacity of the country. Formerly the trade had been mainly devoted to the production of the weaker form of the acid, but now, whilst no additional weak acid was required, the monthly output of the stronger forms had to be multiplied ten times.

This complete change in the proportions of the acid production necessitated the provision of additional plant of a costly character and on an extensive scale. The services of practically all the manufacturing firms were requisitioned, and some of the larger ones undertook the installation of additional plant, but it was perfectly evident that we could not expect private firms generally to incur an expenditure for which the whole course of the normal industry of the country provided no sufficient justification. It was therefore decided to erect national factories for the production of the strong acid, and the greatest of them were provided, under the guidance of Quinan, at Queensferry and Gretna. Owing to the rapidity with which these plants were erected and the splendid output they gave, not only did we obtain acid at a much cheaper rate than could have been secured by contract, but it became possible to allot to the makers of artificial manures all the weaker acid they required and a good margin was still available for general purposes.

The existence of these huge factories necessarily raised important questions for the trades concerned, and, early in 1917, in conjunction with Lord Ashfield (then Sir Albert Stanley, President of the Board of Trade), I received a deputation representing the acid producers and the fertiliser trades who were very perturbed as to their future position in view of the fact that the country had become possessed of at least three large and splendidly equipped national factories capable of producing the strong acid at most economical rates and altogether beyond the total pre-war requirements of the

country. They wanted to know what the Government had in their mind as to the future use of these plants. The fact was of course that the factories had been erected to meet an urgent war need, and the Government had had no time to give thought to their future use, apart from the fact that it was impossible to say who would be governing the country when the war ended, and under what circumstances. The result, however, of this meeting was that a Joint Committee was appointed, under the Chairmanship of the Rt. Hon. Mr. Shortt, K.C. (afterwards Secretary for Ireland and Home Secretary), and he provided us with one of the most valuable and important of all the Reports affecting reconstruction problems.

No explosive factory caused us more perplexity as to where it ought to be than one at Gretna. We needed a place which, for safety's sake and for many other reasons, covered a large extent of fairly level open ground, and it was surprising to find, when all the technical considerations had been taken account of, how few suitable sites there were. Moulton, with his chief men (Sothorn Holland, Quinan, and Sir Keith Price), were very emphatic as to the suitability of the Gretna position. It was a vast undertaking, and it was carried through by Sir Edward Pearson and a body of experts under him with remarkable expedition and smoothness. Had it not been for Gretna and its supplies we could not have met the immense demands for propellants which the enlarged programme of November, 1916, cast upon us. Its remoteness necessitated the provision of the attractive and well-managed township that sprang up there to accommodate the workers.

The following diary note, made immediately after my first visit, gives some indication of the character of the undertakings at Queensferry and Gretna—

"Monday, May 8, 1916.

"On Friday afternoon I left for my long deferred visit to Queen's Ferry and Gretna, accompanied by Henriques and Price. We stayed at the Grosvenor Hotel at Chester on Friday night, and met Pinder, the Chief Engineer of Queen's Ferry, and Lake, the Labour man. The whole of Saturday was spent at Queen's Ferry. It is a fine achievement. What was bare ground ten months ago is now a huge explosive factory with its miles of pipes and railroads. There is an oleum¹ plant already in operation and three other huge ones approaching completion. A large nitrate plant is also in operation. At the moment there are about 1,400 women working on the nitro-cellulose plant and a good number on the T.N.T. plant, which is in full working order. It will, however, be some time before the full construction will be complete. It is about two miles long and, next to Gretna, is probably the biggest factory of its kind in the world. I quite agree with L. G. that Quinan, the designer

¹ Oleum is the strong, fuming, sulphuric acid.

of it, is full worthy of any honour we can give him. The whole thing almost works by itself, and in the most complicated and dangerous parts it is full of ingenious devices of all sorts from one end to another. . . .

" . . . On Sunday we had a long day at Gretna and Dornoch. The factory site is nine miles long from Gretna to Dornoch, and two or three miles wide. We spent the morning with Pearson and K. P. Hawkesley (the Chief Water Engineer) at Dornoch, where there are enormous acid plants. The oleum output alone in a month will be more than was produced in a year in the whole country before the war. Glycerine is exactly double our pre-war national output, and so on. There are big works at the Dornoch end which, with the exception of the nitro-cellulose powder plant, should be a permanent national asset, especially with the magnificent water and power supplies that have been arranged. The townships are two—one at the Dornoch end, which I think we shall have to add to by a considerable number of permanent cottages, and the other at the Gretna end. The works at the Gretna end cover some three or four miles from north to south and are mainly devoted to cordite manufacture, ether and acetone production. The oleum and nitrate plants and the cotton-waste are treated at Dornoch to the nitro-cellulose stage and the glycerine is brought to the nitro-glycerine stage. These are then brought to the Gretna end, where the powder is dissolved in acetone for the cordite or in ether for the R.D.B. powder, then mixed with the nitro-glycerine to the paste stage, coming along through the different houses by a number of ingenious arrangements to the south end, where the completed article is led into the railway trucks. There is also a large reservoir five miles away, drawing water from the Esk, of which Hawkesley is very proud and which we saw in the afternoon. The morning was devoted to Dornoch and the afternoon to Gretna . . .

" . . . A short time was taken up in the afternoon by the reception of the members of the Russian Duma who had come to pay a visit. Pearson took them in charge and they passed in and out amongst the different railway lines on a special train from the Gretna to the Dornoch end, where they rejoined their own train. Pearson is never flustered and oversees the work of twenty different contractors, employing 12,000 men, with the quietness that most efficient men display . . .

" . . . I managed to squeeze in a conference with the lady superintendent about the arrangements being made for canteens, girls' meals, etc. . . .

" . . . At the station, on our way home, I had a talk with the Chief Constable of Carlisle on the drink question, which is becoming very urgent in the city by the migration on Saturday evenings of 6,000 to 10,000 navvies, and he is heartily in favour of our taking over the whole of the licensed trade in the place."

Before leaving the subject of Gretna, I cannot resist relating a little story that illustrates how, whilst patriotic considerations may prompt men to give their lives for their country, they may take on a different character when the pocket is affected. Early in 1916, when Gretna was getting under way, I was subjected to great pressure by a manufacturer of a particular brand of oatmeal "to give instructions that none of his employees were to be engaged at Gretna." Judging from what was said by the Members of Parliament who represented his case to me, I gathered that he was a

thorough believer in personal liberty and probably also an ardent Liberal. Nevertheless his idea appeared to be that if a girl employed in his factory wanted to leave and go to work at Gretna, I was to step in and veto it. We did not, of course, possess any powers by which we could have done so, and Heaven forbid that we should. Such powers would have had to be general, and it is difficult to see how they could have been exercised with fairness and discrimination, even if Parliament had been so short-sighted as to endow us with them. The manufacturer of patent oatmeal was willing to leave the difficulties to us. What mattered to him was that Gretna might interfere with his private mill. I pointed out to him that ordinary oatmeal made excellent porridge, as nobody knew better than the Scottish housewife, and it did not appear to be a war necessity that people should pay something extra for special preparations, no doubt excellent enough, but which, after all, were only oatmeal. So incensed, however, was he at this refusal that his pressure led to the subject being brought up in the House of Commons, and there is not much doubt, I am afraid, that he must be numbered amongst the personal enemies which duty compelled many of us to make in those days.

Coming back from this digression to the main theme, it may be mentioned that in seeking to obtain a substitute for the weaker sulphuric acid so that more might be available for general purposes, a scheme was inaugurated which led to the extensive substitution of a material known as Nitre Cake. This is a waste product in nitric acid manufacture, and had hitherto been disposed of either by emptying it into the sea or by dumping it on to waste land at considerable cost. A great sum of money, and much acid, were saved by using it for various textile processes, for sewage disposal, mineral-water manufacture, calico printing, bleaching, rag-stripping and other processes. Whether it would be economical in peace time to move and use this material for these purposes in preference to the weaker acid, of which abundant supplies are forthcoming, I cannot say, but it was certainly of great assistance during the war.

The most important limiting factor in the production of sulphuric acid was the shipping required for the importation of the necessary iron pyrites, and all through the submarine campaign we had to secure the importation of more than half a million tons per annum for that purpose in excess of normal supplies. The same difficulty applied to the large imports of nitrate of soda from Chile, for which the explosive programme, from the second half of 1916 onwards, compelled us to transport 490,000 tons every six months.

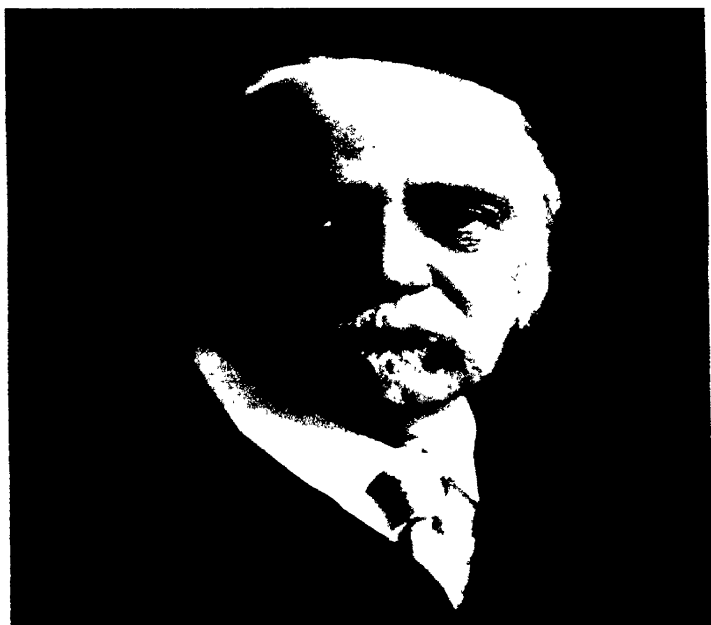


FIG. A. 1. K. — HON. LORD JUSTICE MOULTON, F.R.S.



MR. K. B. OLINAS

The Germans were cut off from Chilian supplies of nitrates, and it would have been an immense relief to our shipping problems if this country had been able, as Germany was, to supply itself with nitrates by synthetic processes from the nitrogen of the air.

The most outstanding of all the great services Moulton and his colleagues rendered was in connection with the use of nitrate of soda. When the Ministry of Munitions came into existence, Moulton, with prophetic insight, was already insisting upon the overwhelming importance of supplementing our supplies of high explosives by the use of mixtures containing ammonium nitrate obtained from the nitrate of soda, in conjunction with the ammonia from the coke-ovens and gas-works. In June, 1915, he did not know, nor did any of us, what the vast extent of the future demand would be, but one of the first steps he took when the Ministry of Munitions was formed was to send to Lloyd George and myself a memorandum couched almost in passionate terms on the vital necessity of securing the adoption of an explosive mixture containing ammonium nitrate.

Hitherto the artilleryman had looked to two forms of high explosive—Lyddite or Picric Acid, and Trotyl—colloquially known as T.N.T. But there was a distinct limit to the production of both these substances. The essential ingredient of trotyl was a substance known as toluol, obtainable as a by-product from coke-ovens. The German coke-oven recovery plants were much superior to ours, and the amount of toluol that they could produce was much greater. According to Moulton's view, and events justified it, the greatest possible output that could be obtained in this country—after allowing for the supplementation of our home supplies by the importation of petroleum from Borneo—would be represented by a maximum weekly output of 1,650 tons of trotyl. Naval and other requirements, however, necessitated the use of much of this material in a pure state, and involved a substantial deduction from what would otherwise be available for land warfare purposes. On the other hand, the alternative high explosive, lyddite, was even more limited than trotyl, for it depended upon our total available supplies of carbolic acid, or phenol, either in the natural form, or artificially manufactured, and it appeared that if we were to make use of every available ounce that the country could produce we could not attain an output of lyddite greater than a thousand tons per week. It would, moreover, be a long time before either of these two materials on this great scale could be obtained, and it was perfectly evident that, with an ammunition programme involving an increased use of heavy shells, none of the forms of high explosive hitherto looked to

could possibly provide us with much more than half of what would be required.

There were two forms in which a mixture of the ammonium nitrate and trotyl could be filled into shells ; one in which they were melted together in a mixture containing 40 per cent. only of ammonium nitrate, and another in which the two ingredients were reduced to a fine powder and pressed into the shell. This latter mixture, however, had the enormous advantage of containing only 20 per cent. of the scarcer trotyl, and 80 per cent. of the much more abundant ammonium nitrate. Everything, therefore, depended upon securing the successful use of these mixtures, especially of that known as the 80-20 mixture. Had this difficulty not been overcome we could never have supplied the Army with the high explosives they required. In this as in other matters the expert artilleryman was difficult to satisfy, and he had much on his side, for it was a full year before the blind shell difficulty had been overcome, and the successful detonation of the 80-20 mixture had been obtained.

It was due, primarily, to the unflinching determination of Moulton, Sothorn Holland, and their group of chemists ¹ that we secured the mastery of the difficulties involved, and the Army became fully supplied with explosives for the great artillery programmes of the closing years of the war. Moulton and his men staked their reputation upon this issue, and at the beginning they had very much against them beside deeply rooted prejudices, and it is scarcely possible to overstate our indebtedness to them for the unqualified and complete triumph that was obtained.

I cannot refrain from mentioning one of the most pugnacious and delightful supporters of the new explosive. Lord Chetwynd was the presiding genius of the great filling factory at Chilwell, near Nottingham, and he put his whole force into securing the successful filling of the heavy shells with 80-20 mixture. It was well that Moulton, notwithstanding his resolute judicial calm, wealth of knowledge and complete confidence in his case, was backed up by men like Chetwynd, who could not, by the most charitable, be described always as either calm or judicial. But Chetwynd had his goal before him, he meant to reach it, and he did.

Parenthetically it may be recalled that we had a good deal of difficulty about that time in connection with one of Moulton's chemists, who, unfortunately, had a German name. His position, as well as ours, was obviously difficult, but Moulton took his stand without qualification beside his subordinate. The chemist was

¹ A list of the Chemical Advisers of the Explosives Department will be found in the Appendix, No. 6.

left undisturbed, and we were greatly indebted to his researches for augmenting our supplies of acetone, an important material required in the manufacture of nitro-cellulose—one of the two propellent explosives.

Another substance in which our necessities compelled interference with the domestic life of the people was the production of glycerine. All the soap-boilers of the country were brought into the service and their supplies requisitioned, but the ration of the resulting glycerine which could be spared for any non-essential purposes was very small indeed; even the supplies for medicinal purposes had to be cut down to a very low figure. One of the chief results, however, of our activities in this direction was manifested in the price of soaps, cattle-cake, and other commodities. In the early days we concluded a very excellent bargain by making an arrangement to secure our supplies of glycerine at a fixed price for the whole duration of the war. The price agreed upon was somewhat above the existing market rate, but before long it was far below it—indeed, for the last two years of the war it was only about a fourth of the price obtainable for glycerine on the market. As time went on and the price of palm kernels and other raw materials increased, what return could not be obtained on glycerine had, of necessity, to be put on to the other products obtainable from these sources, and the good bargain made by the Ministry was therefore responsible for some of the augmented cost of soap, cattle-cake, margarine, and other materials. So far as I can remember, this bargain compelled me, on the only occasion that I know of in my ministerial career, to resist the reduction of the price of a common commodity, namely soap. Early in 1917 one of the largest manufacturers of soap in the country proposed to grocers and other holders of stock that they should charge a reduced price for soap and that this reduction should apply to the stocks they already had in hand. This proposal caused a panic amongst the small soap-boilers, from whom we obtained, in the aggregate, nearly half our glycerine supplies. They were tied down to the price obtainable for their glycerine, and their only alternative was to compensate themselves in the price of soap.

John Mann, Henriques and their colleagues investigated the case and were convinced that to reduce the price of soap would mean that the small producers would have to give up their business, or, perhaps, reluctantly make it over to their more fortunate and bigger competitors. In any case it was evident that the proposed reduction in the price of soap would jeopardise our supplies of glycerine, and we dare not risk that, so it fell to my lot to interview the leading representative of the more powerful section of the trade and inform

him that we could not consent to his proposed reduction in the price of soap. We held in our hand of course the enormous powers vested in us under the Munitions of War and the Defence of the Realm Acts, and had only to issue an order to fix the price of soap, so that the project was dropped. I confess that I felt grateful to the predominant partner in the soap trade that nothing leaked out at the time and I was not bombarded by questions in Parliament and remonstrances from justly indignant housewives because of my having been reluctantly compelled to make them pay a little more for soap than they need have done.

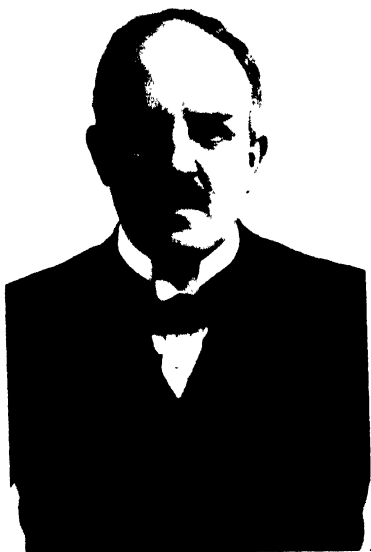
Glycerine was required for the production of one of the most important of the propellant explosives, namely cordite, but it possessed a very great drawback. One ton of glycerine required the importation of thirty tons of raw materials, and the more we became dependent upon cordite the more our demands upon tonnage were increased. Not only so, but the more the raw materials were split up for glycerine the less was available for margarine and other food products. Our interest in palm kernels and kindred raw materials was accordingly very great and led to the establishment of a small section which we used to call "Oils and Fats," under the charge of Mr. A. Bigland, M.P. He knew the trade inside and out, and every now and then would come along with some ponderous and emphatic advice as to purchases, or as to holding off from purchase, which I believe we uniformly acted upon and, in nearly all cases, with substantial profit.

A form of propellant explosive, alternative to cordite, was nitro-cellulose powder, and this could be and was obtained in large quantities from America. One ton of nitro-cellulose explosive involved the importation of only four tons of material, and it contrasted therefore very favourably with the cordite upon which our pre-war practice had made us so dependent. But, just as in shell production we dare not allow ourselves to be unduly dependent upon overseas supplies, so the programme of propellant explosives was at all times a sort of working compromise between cordite and nitro-cellulose, whilst extensive arrangements were made for the production of the nitro-cellulose powder at home.

Whatever we produced, however, we found ourselves before long confronted with perplexing tonnage problems, and the production of alcohol as a solvent in the manufacture of propellant explosives brought us a crop of shipping difficulties. Our policy was obvious: namely, to take from the distilleries what would otherwise have been devoted to drinking purposes and at the same time reduce the quantity of grain used as much as possible. Action



SIR R. SODEREN HOLLAND, B.



SIR K. G. W. PAINE



SIR H. ROSS SKINNER



SIR FREDERIC NATHAN, K.C.B.

on these lines was beset with a host of technical and trade difficulties and brought us into intimate contact with the whole distillery trade. From the first, a different treatment had to be applied to those sections of the trade which used what is known as the "patent" stills, as distinguished from the other users of "pot" stills, and thereby many embarrassing questions were raised which it fell to my lot to have to deal with for a long time in conjunction with Sir Frederick Nathan and his second in command, Major Walter Bagot.

The greater part of the alcohol—and the only alcohol that was suitable for our purposes—was produced in the Patent Distilleries. They make use of unmalted grain, chiefly maize, with about 70 per cent. of malt, and the resulting spirit is supplied to rectifiers for the manufacture of gin and cordials and a small quantity for whisky. About a sixth, however, of the spirit produced from the Patent Distilleries is made from molasses and is devoted to industrial purposes. The Pot Distilleries, on the other hand, use malted grain only, principally barley, and their spirit is sold to the whisky blenders. Necessity therefore compelled us to take over the whole of the Patent Distilleries, whilst we had no use for the output of the Pot Stills. There were only twenty-eight of the large producing Patent Distilleries, whilst there were 160 of the smaller Pot Stills either in Scotland or in Ireland. In 1916 we had taken over all the Patent Distilleries, and the Government instructed us to place the Pot Distilleries on a reduced ration of grain. We therefore found ourselves involved in complicated and difficult trade questions as between the different groups of distillers.

The action of the proprietors of the Patent Distilleries was an excellent example of patriotic co-operation. The section of the trade that controlled the Scottish Pot Distilleries willingly reduced their output to the allowance proposed, but the Irish Pot Distillers were always difficult. They were no doubt as patriotic as anybody else, but when it came to finding a basis on which the reduction of their output was to be prescribed, somehow it took the form of trying to secure a standard that would have meant little or no reduction at all; and, in view of the fact that the proprietors of the Patent Distilleries were not getting a single ounce of their product for trade purposes, it was not always easy to be patient. The only way to work things was to bring in the trade itself to arrange the necessary adjustments whilst we fixed the bulk allowances. At one time it looked as if it would be necessary to take the spirit that had already been manufactured and put aside for drinking purposes. This was a course to be avoided if possible because, apart from the questions of trade compensation and disturbance

concerned, it was much more costly than the spirit produced direct from the distilleries and would have required special plant to bring it into the appropriate form. By the end of 1916, however, an arrangement had been made whereby, under the chairmanship of Nathan, with representatives of the Boards of Customs, of Trade and of Agriculture, a working committee with the following seven gentlemen from the distillers superintended the execution of the work—

Mr. W. H. Ross, Chairman of the Distillers' Committee, and
Sir Alexander Walker,
Mr. James Robertson,
Mr. S. C. Bayne,
Mr. Andrew Jameson,
Mr. Richard F. Nicholson,
Mr. Thomas Shelley.

The tonnage position became so bad at the beginning of 1917 that we could not guarantee any grain for the Pot Distilleries, and we had to close down some of the Patent Distilleries that were producing alcohol only. We were able to do this because the scientists helped us by devising processes whereby a great deal of the alcohol used as solvent was recovered for renewed use. But we could not shut down the distilleries that were producing yeast because a point had been reached when the dominant consideration was the maintenance of the yeast supply.

Twenty-four thousand tons of grain per month were required for the distilleries that produced yeast, and we obtained therefrom about 700 tons of yeast per week. The question was, could we safely reduce the amount of yeast that was supplied, and to what extent could it be replaced by baking powder or other substitutes? It appeared that the larger bakeries used about 1½ lb. of yeast for each sack of flour, but the smaller bakers used up to 3 lb., whilst in those parts of the country where it was the custom for people to make bread in their own homes the amount of yeast used was greater still. It is the practice in Scotland to carry forward a ferment or leaven from day to day, known as Parisian Barm, and the Scottish baking trade use on the average only about 20 per cent. of fresh yeast. The private domestic bread baking, especially in some parts of the North of England, was seriously extravagant in the use of yeast, but the Scottish system would require to be learned and additional plant would be required before it could be extensively applied. Interference with the domestic habits of so large a section of the population would have occasioned immense dissatisfaction and disturbance, particularly when the supplies of meat were very

much restricted and when the people were compensating for it by the consumption of a greater quantity of bread. If the Scottish practice had been general we could have shut down some of the distilleries and saved a great quantity of grain tonnage.

The supplies of propellant explosives—for which glycerine and alcohol made such bulky demands on tonnage—led Montagu, as Minister of Munitions, to render what I think was his most important contribution to the work of the Ministry. His capacity for rapidly mastering the details of cases was never better illustrated or more required than during his short term at this office. He was appointed after Lloyd George went to the War Office in the summer of 1916, and continued until the fall of the Asquith Government in December of that year. He was put into a position where everything was new to him and where important decisions had to be taken every day—many of them representing the final stages of involved considerations that had occupied, perhaps, months of labour and were designed to meet necessities six months or perhaps a year in advance. Whatever share he may have had in the Cabinet in determining questions of policy, he took a delight in the complicated intellectual exercises which were the essential, indeed the governing, part of the organisation and direction of the Ministry. He was an excellent and most friendly chief to work with, and his tendency sometimes to be fidgety or a little nervous in some of the ever-recurring crises with which we were confronted served to emphasise his humanity and to make him more companionable to work with. Our perpetual labour worries used to get on his nerves rather badly, but I cannot say that on munition matters he was ever fidgety without good cause, and his misgivings over the prospect of supplies of propellant explosives led to his making a very important contribution to our future security. It was our practice, as the secret weekly reports came in, to take selected big topics and go through them carefully with all the men concerned, and sometimes bring them up for discussion in the large staff meetings that were held regularly. During the autumn of 1916, and arising out of his own researches, Montagu became very uneasy as to the position of propellant supplies for 1917, and he discovered a serious weakness in the arrangements for the provision of the different ingredients some months ahead. The result was that at his instigation there was a meticulous overhauling of the position and steps were taken to safeguard future supplies. This proved to be invaluable during the intensified submarine campaign of 1917.

All manner of technical questions, which need not be described, were involved in the issues raised by Montagu, and, although perhaps

we might otherwise have struggled through 1917, the security which we enjoyed in the supply of propellant explosives, notwithstanding the enormous additions to the big-gun programmes, must be attributed in considerable measure to his intervention.

CHAPTER XII

MILITARY AND POLITICAL ISSUES IN THE LATER MONTHS OF 1915

Military Failures—Need for a Strong Staff—Loos—Robertson Appointed—Haig to Command in France—War Committee of the Cabinet—Churchill's Resignation—Blunders of Diplomacy in the Balkans—The Salonika Expedition—Help for the Russians—Carson's Resignation—Help for the Serbians—Conscription an Issue—Liberal Members—Press Campaigns—The Derby Scheme—Kitchener's Proposal—Married Men—Asquith's Pledge—Results of the Derby Appeal—Legislation Required.

IT is necessary at this point, in order to understand some later developments and, in particular, the issues of labour and man-power that progressively assumed so dominating an importance, to make a brief survey of some military and political events of the latter half of the year 1915.

The difficulties which ultimately led to the break-up of the Asquith Government began to make their appearance soon after the formation of the first Coalition, and the provision of man-power for the Army was one of the most important. It affected not only the Army and war services but every workshop and business in the land, and led to a multitude of labour troubles inasmuch as it involved the institution of all sorts of new expedients, every one of which produced a number of perplexing problems. Cabinet differences over man-power were supplemented by others affecting the military conduct of the war as well as by the unfortunate sequence of events in the Balkans.

The failure at Suvla Bay and the failure to make the best use of our early successes at Neuve Chapelle, at Festubert, and at Loos were all due to deficient staff work and in particular to delay in bringing the reserves into effective use. The Ministry of Munitions had been warned of the proposed attack in September, 1915, and although it was not for us to say whether an attack was desirable or not, we expressed in emphatic terms our anxiety as to the effect of an attack in view of the scanty reserves of ammunition which, owing to the shortage of filling capacity, it was still beyond our power to augment rapidly. In the attack at Loos and the

capture of Hill 70 the stock of ammunition was reduced by half a million rounds by Monday, September 27, and the reserves for the heavier guns on the lines of communication had been brought down to very low figures. The delay in bringing up the reserve divisions was so great that the Germans had time to consolidate their position and eventually to rally and drive the advance parties back to Hill 70. Even if the arrangements for getting the reserves rapidly to the front had been adequate, it is difficult to understand, in view of the great initial expenditure of ammunition, how it would have been possible to press an attack, because the weekly supplies of ammunition at that time were far behind what such an effort entailed.

Deficient staff work was the cause of these mishaps, just as it was responsible for the failure to visualise the munitions problem in the earlier part of the year and for the long delay in producing a plan to meet a German advance through Serbia and Bulgaria. In some senses, however, the failure to make the best of the initial success at Loos and the misfortunes at the Dardanelles had useful consequences. They led to the constitution of the War Council of the Cabinet early in December and to practical unanimity as to the absolute necessity for the constitution of a first-rate thinking department both at home and abroad ; indeed, it was, I believe, a condition of the institution of the War Council that a strong General Staff should be set up. Robertson, therefore, was recalled from France to become Chief of the Staff, and Haig was placed in chief command in France.

The constitution of the War Council was, perhaps, the determining cause of Churchill's resignation of his post of Chancellor of the Duchy. That office had left him time to take an active interest in all discussions connected with the war, and, although we ourselves had sometimes found his interventions embarrassing, the net effect of his keenness, whether in connection with tanks, the Stokes gun, or anything else, was advantageous ; and I, personally, was sorry when he went. He himself told me shortly before his resignation, when discussing some questions affecting the despatch of bombs to Gallipoli, that he no longer had much influence in these matters, and he said it with real disappointment and with some irritation. In his statement in the House of Commons he dealt chiefly with Naval matters, and particularly with the unfortunate series of events in the Dardanelles, but his disappointment over his non-inclusion in the Committee of the Cabinet which had been given special charge of war affairs was, I think, a final and determining cause, as it left him without any share in active war work.

Whatever may be attributed to the faults of military leadership in the latter half of 1915, the troubles which beset us during that period were just as much due to bungling and indecisive diplomacy. We made the worst of things in the Balkans, for we failed to secure either the early co-operation of Greece and Roumania, or to prevent Bulgaria allying herself with the Germans. Roumanian co-operation much depended upon the terms which Russia would offer, whilst any Russian offer in its turn was greatly dependent upon the amount of help, especially with rifles, that could be provided for her by the Allies. The Russians themselves may have been difficult enough, but their internal troubles had already become so considerable that they were prepared to go a long way to meet suggestions put forward by the French and ourselves provided adequate supplies were afforded. Their notions of what was adequate were admittedly of a chaotic character; but we always found it possible in munition matters, where we were dealing with hard facts, to induce them to be satisfied with what they could make an effective use of rather than with some extravagant demand put forward more in the spirit of the Oriental than as a business proposition.

Diplomatic affairs, however, were so managed that we contrived to keep Roumania nervous and hesitating, to affront the Greeks—whose monarch was only too glad to jump at an opportunity of undermining the power of Venizelos—and to display a lack of decision that was the best encouragement Ferdinand of Bulgaria could possibly have had. Unfortunately all this happened at a time when it was of vital consequence to help the Serbians to the utmost extent if the scattered remnants of their forces were to have any opportunity of being reconstituted. Whether the sending of an expedition to Salonika was the best way of rendering this help is not a matter on which I am qualified to express an opinion, but subsequent events seemed to justify it. Having, however, determined to send one, it was surely necessary to have reached such an understanding with the Greek Government as would not have led to the unfortunate admiral in command being kept hanging about outside the port whilst a decision was being arrived at as to whether the troops were to be put ashore or not. As it was, the affair was so handled that Venizelos had to resign, Constantine made use of the affront to Grecian sovereignty that was offered by the proposed landing without his assent to ignore their treaty obligations to help Serbia. If Roumania had been brought in earlier there is no doubt that Venizelos would have been sufficiently strengthened to bring in Greece also, and this trouble would not have arisen. If the French, Italian and British Allies

between them had been prepared to scrape up half a million rifles with ammunition for the Russians there would have been an attack in Bukowina, and Roumania would have come in earlier. As it was, when these hesitations had produced such unfortunate results, the French and the Italians between them found most of the rifles and we contributed the major part of the ammunition.

Whilst the transports were waiting outside Salonika there was a strange hesitation at home, and Carson resigned because of the decision—provisional at least—not to give this support to the Serbians. His resignation coincided with a vigorous insistence by the French on the importance of prompt action at Salonika, and it helped the Serbians. At all events within a few days the policy was changed and the landing was effected.

A split in the Government at that time would have had disastrous consequences abroad, but I am not sure that the prevailing fashion to attribute all the blame for indecision to Asquith was justified, although he seemed to allow things to drift in a surprising way. There were all sorts of cross-currents in military advice that added to the uncertainties, and the diplomatic handling of the business was so feeble and indecisive that he may well have been occupied in trying to arrive at some understanding of the attitude of the diplomatists, who did not seem to know their own mind from one week to another.

Early in November, Kitchener was sent out to examine affairs in Gallipoli and the Eastern Mediterranean for himself, and although we had then landed the troops at Salonika, he appears on his return to have taken the view that it would be best after all to evacuate Salonika. As a result the whole matter was again in a state of indecision and provided occasion for the inter-allied conferences at Calais during the first week of December. Whatever may have been the strategical considerations involved, there is no doubt that our evacuation was sincerely desired by the Kaiser and by King Constantine, and it would have been strange if the same course of action would have been equally serviceable to both hostile parties. Withdrawal would certainly have bestowed on the Bulgarians a liberty of action they never afterwards possessed. Happily we were saved this ignominy, for, though the proceedings at Calais pointed to evacuation, the Council of the Military Chiefs in Paris was unanimously against it, so that by the end of December, after many weeks of haggling and hesitation, it was finally decided to stop at Salonika and defend it to the utmost.

Coincident with these events the improved prospect of munitions supply at home gave urgency to the question as to how the men

for the Army of 1916 on the enlarged basis were to be obtained. Everything went to show that to press for general conscription, as some wished to do, would have aroused intense passions and occasioned a national quarrel of a serious character. Voluntary enlistment was still going on briskly, whilst the deficiency in equipment of many of those already enrolled was common knowledge. The country therefore had not come to recognise that general conscription was a necessity, as, indeed, it was not at that time. Most Members of the Liberal Party and all the Members of the Labour Party in the House of Commons were openly opposed to it, but it had become a burning question. So incessant were the enquiries as to the attitude of different Ministers that I used to avoid going to the House except for official business, in order to escape being badgered by Members who wanted reassurance as to Lloyd George's attitude and confirmation of this or that rumour of Cabinet dissension. The perturbation in the lobbies and outside was so widespread that on September 20 Lloyd George issued a statement in the form of a reply to a letter from a constituent, the substance of which was to ask that the Government might be left to make proposals as the necessities of the case required. Kellaway, who was then my private parliamentary secretary, reported almost every day that members of the Liberal Party were increasingly resentful over the personal attacks on Asquith in the Northcliffe newspapers, which were conducting a campaign in favour of conscription. This group of journals seems alternatively to take the line that a public man is either a hero who can do nothing wrong, or so incompetent that he is altogether unworthy of public confidence, and Asquith at that time was placed in the latter category. Nevertheless, both then and during the following year, I and many others made no secret of the impatience we felt at the delays in arriving at decisions, and often at the decisions themselves. The events of 1916 will be dealt with later on, but the attacks which were being made on Asquith, involved as he was in a tangle of difficulties, very properly gave rise to the keenest possible resentment.

Early in October, as a sort of rejoinder, there appeared in the *Daily News* an account of some Cabinet proceedings—which I was told was so accurate that it must have been inspired—and which went to create the impression that Liberal Ministers, and in particular Lloyd George, who supported conscription, were faithless to Liberal principles and in a measure parties to the attacks on the Prime Minister. These rival Press campaigns intensified the political unrest although they were only the outward and visible signs of the controversies that were going on inside.

Amongst other memoranda which I had to prepare for my

Departmental Chief at that time was one reviewing the subject of man-power as it was affected by the prospective supply of munitions. The case as it then stood is I think fairly accurately represented in my personal note of it of September 19. It was proposed that seventy divisions should be available by March, 1916, and these would require, allowing for wastage up to December, 1916, and the maintenance of half a million men for Home Defence, a total enrolment of nearly three millions. After allowing for casualties, and apart from the Navy, there were at that time enrolled and more or less trained, but not all armed, about 2,400,000 men, but we could not, according to the most sanguine estimates, have the full equipment for seventy divisions ready before March, 1916. The note quoted from goes on to say—

"Although it will probably come to general conscription if the war goes on, I cannot therefore see any sense in turning the country upside down to take say half a million men away from employment for six to nine months before they can be armed, since if we can obtain 600,000 recruits between now and next June by the voluntary system we can be sure of the seventy divisions up to Christmas, 1916. There have been more than two million recruits within the last twelve months, although many of them ought not to have been recruited from some workshops, but if the National Register is well worked, with the co-operation of the organised bodies both of employers and employed, we ought by June next to get all the men we want without interfering with vital industries."

The serious defect of the voluntary system as we saw it then, and as it was being operated under the Derby Scheme, was that a great number of keen young men joined up who could not be spared from vital industries, and that many who could have gone and ought to have gone did not enrol. There was also an increasing amount of just indignation over married men attesting and incurring the risk of being called up, whilst these single young fellows who could be spared had not come forward.

The voluntary enlistment of skilled workers was a source of constant difficulty to us at the Ministry of Munitions, but when conscription came to be applied later on it brought a set of troubles, equally embarrassing, if of a different character. Although, therefore, even then, conscription seemed the more rational way of getting the men, it could not be open to doubt that any proposal to apply it would have been vehemently resisted. The internal political situation, however, became so difficult, that my note of October 15 says—

"So far as the Cabinet is concerned it still holds together, and that is about all that can be said. Kitchener's proposal now holds the field as an alternative or supplement to present methods."

The report of the Cabinet Committee which had examined this question revealed, as was to be anticipated, strong differences of opinion, and, apart from Cabinet proceedings, Harcourt, Simon, and in a lesser degree McKenna and Runciman, made no secret of their antipathy to conscriptionist proposals, whilst, on the other hand, a few were enthusiastic out-and-out conscriptionists. Lloyd George was sympathetic to the conscriptionist view, but he was careful not to commit himself. A split was, I think, only avoided by the discussions that arose out of the proposal submitted by Kitchener ; and in submitting it he certainly rendered a conspicuous service. His proposal substantially was that a quota should be allotted to each district, and if by a given time the men had not been obtained, or were not likely to be, either by present methods or by an improvement on them, then a compulsory ballot for the balance was to be taken. This was a more modest proposal than the conscriptionists wanted, but for the time being they rallied to it.

Kitchener's scheme was not finally adopted, but it paved the way for the provisional arrangement whereby increased efforts were to be made under the Derby Scheme on the understanding—as announced by Asquith in his speech in the House of Commons on November 2—that married men would not be called up until unattested single men had been dealt with. He objected to the imposition of general conscription because it would impair the maintenance of national unity, and, whilst not ruling it out, said that it could only be resorted to when it commanded something in the nature of general consent. Balfour and Grey were reported to be most active amongst those who used their influence to prevent a break, and their efforts were fortified by the reports of the internal position in Russia, which revealed that any lack of unity or loss of driving force in this country might influence the Russians to consider the possibility of concluding a separate peace.

Looking back upon this episode, I think Asquith's management of it was conspicuously able. He avoided a serious split, and in securing the compromise that was finally arrived at, time was afforded for fuller information to be given to the people and for the educative effect of the accompanying discussions to make itself felt.

It was the right thing to do at the time, but it had most maddening effects so far as we were concerned at the Ministry of Munitions. By the end of December there had been nearly 2,000,000 attestations and the first four classes of unmarried men were called up. But these classes contained munition workers, engineers, shipbuilders, and others in essential occupations, and it was not long before we were flooded with telegrams and expostulations from munition

firms as to the calling up of tool-setters, universal millers, and many other men of particularly skilled types. This kind of thing was bound to happen, and it happened again under conscription, but as we had been raking the British Army, so to say, with a small-tooth comb in order to recall this class of worker from the men who had already joined, it is not to be wondered at that the language of the men in Sir Stephenson Kent's Labour Supply department was lurid and unparliamentary beyond precedent.

There was no escape either from the questionings which soon arose as to how the Prime Minister's pledge with respect to married men was to be given effect to. Apart from what he said as to compulsion requiring a sufficient measure of general consent, that pledge was in the following terms—

"I am told by Lord Derby and others that there is some doubt among married men who are now being asked to enlist, whether, having enlisted, or promised to enlist, they may not be called upon to serve while younger and unmarried men are holding back, and not doing their duty. Let them at once disabuse themselves of that notion. So far as I am concerned, I should certainly say the obligation of the married man to enlist ought not to be enforced or held to be binding upon him unless and until—I hope by voluntary effort if it be needed; in the last resort, as I have explained, by other means—the unmarried men are dealt with."

At the beginning of Derby's special effort there were reputed to be about 1,200,000 single men of military age who had not attested or enlisted, but a large number of them were in essential occupations and many were medically unfit, and it was estimated that, out of the total, about 700,000 were available, although the basis of the estimate was conjectural.

It was manifest that the Prime Minister's pledge with regard to married men could not be fulfilled without the introduction of compulsion. Feeling on the subject was so strong that there appeared to be general assent to requiring fit single men, who had not attested, to be called upon to serve before attested married men were required to do so. As the records of the Derby Scheme began to come in, it became certain that there would be a large number of young unmarried men who had not attested and the Cabinet had perforce to consider what was actually to be done in order to give effect to the Prime Minister's pledge. Although general conscription was not involved, the principle of compulsion became a direct issue that could no longer be evaded. The enormous interest in the Derby Scheme, which had resulted in nearly 3,000,000 attestations, had made every man and woman in the land thoroughly acquainted with the issue. Although many young men who were doing highly skilled work and who could not possibly be spared were exposed

to all sorts of stupid annoyances in the streets and elsewhere, the manifestations of opinion were significant of the general sense of the people in favour of giving practical effect to the Prime Minister's pledge. Accordingly towards the end of December there was a resurgence of the difficulty in the Cabinet. Asquith, of course, adhered to his undertaking, and it then became a question as to how that undertaking was to be given effect to in a Bill to be presented to Parliament. It was certain that the ultimate effects of any proposal would be very far-reaching, and those of us at the Ministry of Munitions who were responsible for labour questions looked forward to the future with the intensest anxiety.

CHAPTER XIII

THE SHORTAGE OF SKILLED LABOUR. DILUTION AND OTHER EXPEDIENTS. DISPUTES

Complexity of Issues—Trade-union Leaders—The Treasury Agreement—The National Advisory Committee—Early Shortage of Skilled Workers—Schemes for Augmentation—WAR MUNITION VOLUNTEERS—RELEASES FROM THE COLOURS—Scott, Younger and Others—DILUTION—Office Proposals—The Question of Compulsion—Lloyd George meets the Unions—Henderson's Committee—Grading-Up—Training—Introduction of Women—Taylor and Others—Employers and Employed—The Objections of Specialists—The Real Cause of the Trade-union Objection—Position of Skilled Men—The Clyde—Diary Extracts of the Period—Appointment of Commissioners—Lynden Macassey—The Clyde Strikes—Barrow Strike.

NO section of this story has occasioned me more perplexity than that relating to our experiences at the Ministry of Munitions in the field of labour. Every expedient we thought of and every step we took brought us face to face with contrary prejudices and customs, as diverse as the trades themselves. They affected the conduct of every worker's home, long-established workshop practices, the relations between one grade of labour and another, and between organised labour and employers' associations. We were perpetually engaged in a triangle of forces, with the demands of the Armies for supplies at one corner, the demands of this self-same Army for men at another, and, at the third, a group of trade-union and employment issues needing a perpetually changing adjustment. To describe all this adequately needs someone who could combine Skeat's mastery of meticulous detail with the vivid presentation of Victor Hugo, associated, say, with the delightful generalisations of Bernard Shaw. I have no pretensions to the capacities of any of these authors, and can only make as good a summary as possible of the two years during which I was ministerially responsible for the conduct of these affairs. Lloyd George placed me in charge at the beginning with instructions that I was to report to him occasionally and to invoke his aid only when necessity compelled it.

Some people seemed to think that there were short cuts in these things, and failed to recognise that the issues were continually

changing their form and presenting problems that were as novel and unexpected to the trade-union leaders and to the employers as they were to ourselves. The reason was that never before had such a conjunction of circumstances arisen. I used to wish sometimes that it were possible for some of the more active critics to be placed in charge for one day—not of the whole Labour Department—Heaven forbid!—but of one small section of it, with the responsibility of advising us what action we ought to take that very day in response to the questions the morning's letters brought. It would have cured them of their glib prescriptions.

It was as easy to calculate the labour requirements of the munitions programme as it was to say how much material or how many machines were required; but in this case we were dealing with masses of human beings, and the difficulties were no longer simply those of supply, purchase and transport. Action taken in any one place, on the issue of badges of exemption, or on piece rates, women's wages, or whatever it might be, was soon known in a thousand shops. Nothing could be done in a corner; and anyone foolish enough to think that unpleasant things could be wrapped up and hidden would be subject to a brutal and speedy undeceivment. Employers watching, trade unions watching, the Press watching, the Army clamouring for supplies, the Adjutant-General crying out for men—no man or woman who had to do with these things could satisfy all parties. It was a thankless, tedious, almost heart-breaking job; and we ought to salute, with respect and gratitude, the band of men and women who helped us to deal with these things. Troubles were their daily bread, and not one day knew what the next would bring forth.

The leading members of the trade-union executives were almost as much engaged between cross-fires as we were at the Ministry. I came to know many of them, and recognised the truth of the story, which Mr. Brace, I think, used to tell us in the House of Commons, of the four stages through which a successful trade-union official passes.

When first he gets elected, "Our Tom," say, can do nothing wrong. "He will see to it." "He is just the man for the job."

If he survives this adulation and escapes the swelled-headedness that destroys so many, he passes imperceptibly into the second stage. Questions begin to arise. "Tom did not manage that quite so well." "He is getting a bit too thick with the employers." He begins to have competitors for his job.

If he has the grit to do his work fairly, some trouble will arise that brings him into the third stage. He can do nothing right. "He has let us down." "He never ought to have agreed to the

settlement "; and, as the time for re-election comes round, he has to fight for his life.

If he survives these fights, he passes into the fourth and final stage. His justice and strength have made their appeal ; his old friends lift up their heads ; he has become one of the great fellows who attends cocked-hat conferences. When he takes strong action that is not popular, it is accepted resignedly with local pride in this sturdy man, who year after year beats his competitors with increasing handsomeness. The uselessness of "going for him " becomes more and more obvious. It is no good. "You cannot do anything." He has arrived at the final stage. "The old beggar's a fixture !"

There are not many men who get through to the final stage, but I had to deal intimately with many of those who did. Tenacious, obstinate, difficult, they often were, but loyal and reasonable, and slow to anger though we had to fight sometimes. They had their own difficulties, but they stood by us splendidly on many vital occasions, and their patriotism was sincere. You had to see the inside of their life and work before you could get glimpses of their governing motives, and a little incident, one day, taught me a lesson that I never forgot.

A Scotsman, on one of the engineering executives with whom we had many dealings, was one morning uncommonly truculent and resentful of my statement of the effect the strikes were having upon munitions production, but at a friendly hint on a slip of paper from one of his colleagues I turned the talk aside to other subjects. Afterwards in a corner of the room this man and I had a little conversation. He had only two boys, both of whom had gone from the works. One had been killed, and the other was badly wounded. Happily I had not gone far in making the appeal too personal, and we gripped hands as good friends when we parted. But the incident taught me a useful lesson, and although scores of times afterwards he shook his fist and shouted at me, we were the best of friends and are to-day. As so often happens, he had to do things in his official capacity that might have given, to those who were not aware of all that was involved, a misleading impression of his real disposition.

These two years in charge of labour questions at the Ministry of Munitions, although they enriched my life with many valued friendships in the Department and amongst the employers and trade unionists outside and provided a wealth of experience, seem like a nightmare looking back upon them. Nothing else in the whole period of the war in my experience was comparable in its abundance of perplexity and anxiety.



Photo by Cecil Beaton
SIR W. H. BEVERIDGE, K.C.B.



MR. T. M. T. A.



Photo by Hugh Cecil
SIR HERBERT MORGAN, K.B.E.



The labour story of the war really opens with the Treasury Agreement of March, 1915. It had been reached by Lloyd George and Runciman with the engineers and other trade unions, and related to the principles that should apply in modifications of trade-union practice during the war. Unskilled labour was to be brought in ; there was to be no cutting of piece rates ; and there was to be a restoration afterwards, if the parties desired, of the rights or practices abrogated during the war. A standing committee of trade unionists, known as the National Advisory Committee on War Output, was established under the presidency of Henderson, with Mr. William Mosses as Secretary. Afterwards they had quarters at the Ministry of Munitions and were in almost constant session, dealing with questions brought up by trade unions, or referred to them by us, or with suggestions of their own.

Shortly afterwards, another body of men was constituted under the chairmanship of Sir Herbert Morgan, whose business it was to ascertain the occupations in which safeguards were necessary to maintain the supply of skilled labour.

In the course of time the Labour work of the Ministry fell naturally into two sections : the Supply of the labour necessary for the execution of the munitions programme provided duties for one part, whilst the discussion of agreements, terms and conditions of employment, disputes, arbitration and tribunal questions formed the other (Labour Regulation) section.

The men in charge were as follows : At first, Sir W. H. Beveridge had charge of Regulation, and, under him, Mr. H. Wolfe dealt with tribunal and legal questions ; Mr. S. G. Tallents with Badges ; Mr. J. C. Smith with Wages ; and Mr. J. Charters with Intelligence. On the Supply side, Mr. C. F. Rey was in general charge until the creation of the Ministry of Labour, with Commander J. B. Adams and Sir Stephenson Kent dealing with the demands for labour and with allocation. Sir Herbert Morgan had Building Labour, while Mr. T. M. Taylor concentrated upon training work ; Major F. J. Scott was responsible for Release from the Colours, and Mr. A. F. Butler for War Munition Volunteers. As things developed, substantial changes were made from time to time, and, after Beveridge went to the Ministry of Food, Kent became the Director-General of the whole Labour Department and held that post, all honour to him, to the conclusion of the war. Many other men played active parts and amongst them were some of the best men from our universities. Professor H. W. Garrod left his Greek and became one of our wisest and best assistants, in company with Mr. J. C. Miles and Mr. C. S. Hurst, for legal questions. After Kent became Head of the Department, Mr. W. J. Larke was put in charge

of Dilution, and amongst others who lent a hand was a strong body of Members of Parliament, under Mr. Ernest Craig and Sir James Currie. Indeed, the more one looks into the notes of the events of that time the greater becomes the army of our loyal helpers, many of them volunteers.

As soon as the programme had been surveyed and its results ascertained it was certain that the shortage of skilled workers was far beyond anything previously estimated. How were we to supplement labour supplies without improperly interfering with the demands of the Army for men?

Two schemes were started in the first fortnight of the Ministry's existence. On June 5 Derby, as already recorded, took across to French the draft of a scheme for obtaining the release of essential men from the Colours, and a few days later Lloyd George addressed a meeting of trade-union delegates on a proposal which marked the commencement of the War Munitions Volunteer Scheme, by which skilled men voluntarily undertook to go anywhere to work at munitions.

WAR MUNITION VOLUNTEERS

The Munitions Volunteer Scheme could not be worked without the active co-operation of the organised unions who knew who the skilled men were, and the delegates agreed by a large majority to co-operate with us. There were the usual prolonged discussions as to terms and conditions, subsistence allowances, travelling expenses, and the rest. Rates of wages were the most difficult, for it might well be that a man was receiving a higher rate where he was than that of the district into which he moved, and workshop distinctions had to be avoided. The War Office made difficulties on some of the conditions, but, thanks to the direct intervention of Kitchener himself, they were overcome. By July 80,000 men had enrolled, but as soon as the lists were examined it appeared that they were to a great extent paper figures. The majority of the men were already engaged on war work; a considerable number more were not skilled, or not sufficiently skilled, and many others were employed by firms who were then being brought into munitions manufacture. The result of it all was that by January, 1916, only 4,000 had been transferred, and the demand for skilled labour was greater than ever. In the course of time, although the enrolments were always vastly in excess of the numbers that could be moved, more discrimination was exercised and the methods were improved, and on the whole we had less trouble with this scheme than with any other. The enlistments came to number 160,000, but the eventual result was

that we had a mobile corps of some 38,000 men, and it is no exaggeration to say that without them the munitions programme could not have been carried out. By their aid many national factories were started in the first instance, and they were used in the early days of many aeroplane and aero-engine shops, for special parts of the augmented gun programme, for tanks, and in other kindred ways. They supplied the vital nucleus of skilled labour that got the factories going and held the fort until their places could be taken by others.

RELEASE FROM THE COLOURS

The Release of men from the Colours Scheme by its nature was a sort of beggar-my-neighbour business, but the successive Commanders-in-Chief, as well as the staffs at the War Office, recognised the need for it. The reader may be very sure that in putting forward a demand for any class of men for release the Ministry had to make a good case with the War Office. The first necessity was to find out who the skilled men were, and where they were. The Ministry sent circulars to 8,500 engineering firms inviting them to send in the names of skilled workmen who had enlisted from their shops and the War Office attestation papers were also examined. Many of the men, to their credit, wanted to remain with the fighting forces, where some of them had become non-commissioned officers and were amongst the best men in the companies, so that however precious a man might be to us, and although our representative visited the unit with the blessing of the War Office and the Commander-in-Chief, it was against human nature, from the Company-Sergeant to the Colonel, to part with him if it could be avoided. To get a good man out was like drawing a favourite tooth.

The first, so-called, "bulk" release scheme was operated during July and August, 1915, and gave us the names of some 7,000 soldiers; but when each case had been carefully investigated there were only about 2,000 who came within the agreed classes. This was followed by a second effort during the autumn of 1915, and all the units throughout the United Kingdom were investigated. It was a tedious business. Scott was a thorough-going man, and he needed to be, for he had to organise the visitation of all these units by a body of investigators comprising 157 men, of whom sixteen were Members of Parliament. A million and a half men were paraded from September to November, 1915, and out of these some 40,000 were selected as being possibly sufficiently skilled to be available. It was one thing, however, to get names, but quite another thing to obtain releases on agreed terms, and

there were interminable negotiations as to conditions of employment, army and civilian status, allowances, and all the rest of it. The whole of this business was managed by a group of men under the chairmanship of Lord Younger. Every case had to be dealt with separately, and Younger and his colleagues spent many weary hours every week for several months hammering these things out.

At different times afterwards there were special missions to the units for particular classes of skilled men. Lord Desborough and the Rt. Hon. G. N. Barnes, as representing the Ministry of Munitions, along with military officers, went through all the units of the British Front in the spring of 1916 to select tool-setters and other specially skilled men, and brought over nearly 2,000 carefully chosen men. In August and September, 1916, the development of gas warfare and explosives made us shorter than ever of skilled chemists, and with Haig's concurrence a special search was made for them in the ranks in France, and a goodly number, often much against the grain, were extracted for use at home, and others were attached to the special force dealing with chemical questions at the Front. About the same time, also, blast-furnacemen had to be sought for in every unit of the Army. To make matters worse for us, however, as the munitions multiplied in France, so the demands of the Army itself for artificers and skilled workpeople grew, for as much repair work as possible was done in France. The Commands there adopted similar methods to our own but under more advantageous circumstances, and further drained the reservoir by finding 30,000 artificers for the Royal Flying Corps, the Army Ordnance, the Artillery and the Army Service Corps. It was a long time before the Ministry obtained any substantial body of men by release from the Colours, although before the end of 1916, 45,000 men had been secured. They were drawn from 4,136 different units of the Army, and were distributed to nearly as many different workshops. So skilled were these men that West estimated that each one of them enabled employment on munitions production to be found for ten other workers—a large proportion of whom, as time went on, were women.

DILUTION

The Ministry had not been established many weeks before we realised that, neither by the aid of munition volunteers nor of men released from the Army could we make any appreciable impression upon the unsatisfied demand for skilled labour. By the middle of September, 1915, the unsatisfied demands had risen to over 80,000 and the position was becoming more and more desperate. Rey's report to me for the last week in August is typical of many—

"The demands for machine-gun and rifle factories nearing completion is about 20,000, of which 6,000 should be skilled. The demands for the big-gun ammunition factories to be ready by the end of the year are, I understand, somewhere about 180,000 of all grades, of whom between 20,000 and 30,000 should be skilled. This does not take into account the labour requirements of other factories, national and others, which will shortly have to be met as they become increasingly engaged upon the new programme."

Rey and a number of his colleagues set themselves to estimate the number of skilled men still on civilian work, and they found a vast number. Professor Chapman, at the Board of Trade, reported that there were at least 150,000 skilled men such as we wanted still employed in that way, but when the case was further explored it transpired that many of them were employed on essential machinery in vital trades, on electrical undertakings, on the maintenance of lighting and on other services necessary to the life of the people. Nevertheless, a goodly number remained whom we ought to obtain. It was evident also that many skilled men were employed in munition shops on relatively unskilled work, and grading-up ought to be arranged so that they would be employed only on skilled work.

Accordingly, from August, 1915, onwards, the best men in the Labour Department were examining all manner of expedients for supplying the need. Under the Munitions of War Act trade-union restrictions had theoretically been withdrawn, but as a matter of fact the number of unskilled workers who had been brought in or got on to skilled work was negligible. Rey, Morgan, Sir A. M. Duckham, Gordon, Butler and Evan Spicer were responsible for putting forward a number of suggestions. Morgan was the originator of a plan for recruiting munition volunteers which, although not adopted at the time, served as a guide in a campaign conducted later on by Members of Parliament and others. Compulsion, with its maze of industrial and parliamentary intricacies, was discussed, but was always put aside as impracticable. How were men to be found of sufficient skill, knowledge and judgment to deal with the hundreds of classes of labour in the thousands of workshops throughout the land and pronounce an opinion sufficiently instructed to enable action to be taken upon it? In any case, it would take a long time to develop a reliable organisation. It was on this rock that, later on, Mr. Neville Chamberlain's Man-Power Scheme was wrecked. When all expedients had been discussed, we were brought back to our starting-point, which was to make the Munitions Act really operative by bringing in unskilled people to take an increasing share of the semi-skilled work, by concentrating the skilled men, and, if possible, adding to their numbers by training suitable new entrants.

Every report we had showed that this could be done, and we already had legal enactment and a regular trade agreement at our command. But trade-union restrictions were only nominally relaxed. Indeed, at that very time 400 men in one yard had threatened to strike if volunteers were brought in, and the same kind of thing was happening in many places. Nevertheless, it would be impossible to employ the hundreds of thousands of unskilled people for whom work would soon be waiting unless these barriers were overcome. I therefore proposed to Lloyd George that he should allow me, in consultation with the men in the department, to try and devise a scheme whereby we could secure the co-operation of the trade unionists in a vigorous effort to bring in and train unskilled labour. We knew that in this adventure we should be embarking on a sea of troubles, but there was no help for it. This scheme came to be called "Dilution"—a makeshift name for which, I am afraid, I was responsible. It was never a popular scheme. How could it be when it conflicted with the hard-won privileges of the skilled trade unionists?

When the preliminary office preparations were sufficiently advanced the active campaign was opened by my receiving a deputation of the Amalgamated Society of Engineers on September 13, when the whole case was frankly discussed. The double purpose of the meeting was to give notice of our project and, if possible, secure active co-operation in giving effect to it. The technical details of the discussion need not concern us, but it led the way to a meeting on September 17, when Lloyd George addressed the trade-union representatives and pointed out to them that, whilst we had nearly 100,000 war munition volunteers enrolled, there were not more than 8,000 effective for the purposes of transference, and in reality that the only alternative to making dilution effective and widespread was some form of compulsion. They would vehemently object to compulsion, and on that ground as well as on others it was to be avoided if possible.

The position had been prejudiced by delays and mistakes incidental to the early stages of the application of the Munitions of War Act and to the work of some of the tribunals; but the real fear behind the trade-union opposition was that dilution would be used to introduce cheap forms of labour and thereby supplant their own members and lower the standard of working conditions. The feeling of the rank and file members outside, who thought, not of the Treasury Agreement, but of their own shop, was one of intense suspicion. However, as a result of the meeting on September 17, it was decided to confer and, if possible, to decide upon the terms on which an active campaign should be conducted.

After the usual prolonged conferences, an arrangement, towards which Henderson gave us much help, was arrived at. A Joint Committee was appointed, known as the Central Munitions Labour Supply Committee, and its work afterwards was of very far-reaching importance. Its business was to consider and to advise us upon the many questions that arose affecting the wages and conditions of the unskilled workers and women who were introduced into the work. The reference and membership are as follows—

“A Joint Committee representing the National Labour Advisory Committee and the Ministry of Munitions with additional members has been appointed by Mr. Lloyd George to advise and assist the Ministry in regard to the transference of skilled labour and the introduction of semi-skilled and unskilled labour for munition work, in order to secure the most productive use of all available labour supplies in the manufacture of munitions of war.”

“The members of the Committee are—

The Right Hon. Arthur Henderson, M.P. (Chairman).

W. H. Beveridge, Esq.

J. Kayler, Esq.

J. T. Brownlie, Esq.

Miss M. Macarthur.

W. Dawtrey, Esq.

W. Mosses, Esq.

Alexander Duckham, Esq.

C. F. Rey, Esq.

Charles Duncan, Esq.

Allan M. Smith, Esq.

Charles Ellis, Esq.

G. H. West, Esq.

Secretary, R. C. Davison, Esq.”

The Committee gave its support to a vital principle—“that no skilled men should be employed on work which can be done by semi-skilled or unskilled male or female labour.”

Having obtained this invaluable agreement, detailed instructions as to the method of its application were sent out to many thousands of controlled establishments on October 13. We had a competent enthusiast in Adams, who was in charge, but the process was immensely difficult. When the engineering expert went into the workshop to introduce dilution, it was no longer a question of a general principle, but of precise operations on particular machines; what class of person could be appointed to them; what operations a skilled man should be limited to; what the unskilled man or woman should be started upon; their wages and the conditions of their employment. It involved the creation of local joint bodies to consider disputed questions, joint arrangements for dealing with tribunal cases, and multitudes of similar arrangements. Here, as elsewhere, it was only the disputes and the exceptional cases that drew public attention to what was going on. Troubles were talked about, not the great bulk of cases in which things were amicably adjusted. For the most part the firms arranged with their own

people in accordance with the principles which had been agreed upon centrally. Had it not been so, dilution could never have been effected. No body of engineers, experts or conciliators that we could have supplied could have done it, and the process was helped every day by Henderson's Committee and, most of all perhaps, by the tact and ingenuity of Rey, Kent, Adams, Wolfe and the other men in charge. In this way in less than two years—by dilution, grading-up and instruction—some half a million women became employed in the manufacture of munitions apart from the unskilled men unfit for military service who had been taught to carry out operations previously classed as skilled.

TRAINING

Before referring to strikes and difficulties, it may be appropriate to say a word or two as to how the people were taught. In a great proportion of the cases they were taught in the workshops by the skilled men themselves, who supervised as many operators as the process permitted. In the case of the more technical and difficult operations, special arrangements were made and our monthly training and dilution bulletins provided reading as stimulating and encouraging as the records of the growing ammunition production. In some instances firms set apart shops where skilled instructors were employed. In the five largest of these instructional factories 800 people could be trained at the same time, and these places were especially useful in training for aeroplane production on a big scale. But we could not have met the need in the case of some highly skilled operations, such as gauge-making, tool-setting, acetylene-welding, and others, unless we had obtained the assistance of our universities and technical schools. We longed for more of them and our experience provided yet another of the many illustrations of the folly of the cheeseparating educational policy which the proposals of 1915 were designed to remove. Many of the schools had first-rate instructors labouring along with old-fashioned plant and it was necessary to add to their equipment. Nevertheless, by the middle of 1917, some sixty technical schools and colleges had trained 32,000 students to carry on the more skilled branches of work. T. M. Taylor and his colleagues had one of the most agreeable tasks of any set of men in the Ministry, for they could go straight ahead with their work; the Board of Education, the Universities, and the Education Authorities were only too glad to have an opportunity of finding that this useful work was required of them. They were not harassed every moment by disputes and questionings on a multitude of topics as other men were; their way was a pleasant one and almost strewn with roses;

whilst for everyone else concerned with dilution, substitution, badges, exemptions, and man-power in its manifold forms, their path was set with thorns.

RESISTANCE TO DILUTION

Many times men resisted dilution because they had not clearly understood what was involved, sometimes because mistakes were made in its application, and sometimes they resisted, notwithstanding the assent of their unions, simply because they hated it. The union officials had as harassing a time as we had, for it meant that somebody, generally from both sides, had to be sent to the spot quickly to hear the case, to explain, to intercede, or to arrange for a questionable point to be dealt with by the machinery of conciliation that had been set up. There was a strange inequality throughout the country in these things. In some districts we scarcely ever had trouble, in some others we always had, although the identical processes were being applied in both and to equally well-informed members of the same trades. The dispute map told at a glance where there were and where there were not good working relations between employers and employed. In some places those responsible always managed things peaceably themselves without bothering headquarters, and others never did. The Clyde district from the very beginning was pre-eminent as a storm centre. The only other district which for any length of time exhibited the same kind of temper was Barrow. We had troubles on the North-East Coast, but they were of a different character and not nearly so extensive as was often reported, and the arrangements worked fairly well there once they had become clearly understood.

THE CASE AGAINST DILUTION

There was no case against dilution on its merits. There were the usual specialists' objections at first that things could only be done by the expert after years of training. It is the specialist's claim in every branch of life. The fact that years of training are necessary for a full working understanding of the principles which great professions have to act upon, in medicine, engineering and others, and that without training no man can become a master of his craft, was no reason why some single process requiring little more than manipulative dexterity of a limited kind could not be imparted to people in a short time. Thousands of times our men were told: "You cannot teach unskilled people to do this." In the old days when surgery was a limited art and rested upon a slender basis of physiological or pathological knowledge, Abernethy, who had a vision of the regions of knowledge still unexplored, used

to tease his colleagues by saying that he would take an intelligent cabman from his box and make him a surgeon in six weeks. I derived some comfort from the remembrance of this dictum in obstinately encouraging those who were trying to get women taught a limited number of skilled processes. The most unlooked-for results were obtained in quite heavy trades ; for example, in 1917, 12 per cent. of the people employed in iron-founding were women, and there were over 11,000 of them in the iron and steel works employed in doing work which had always been characterised as exclusively men's work.

The real case against dilution with the trade unionist was, not that people could not be taught to carry out a limited number of skilled operations, but that it swept away long-established trade practices, and imperilled the standards of pay and conditions of employment that had been hardly won. It was this that was at the back of the trouble all along. The men were afraid—and in some districts with justice—that it might be used to depreciate their conditions of work ; and when men have struggled for a generation or more to secure certain rights and privileges and then, suddenly, see them placed in jeopardy, it is no wonder that they entertain misgivings. The Treasury Agreement secured the maintenance of piece-rates and the post-war restoration of rights and, furthermore, was embodied in the Munitions Acts, but these things seemed a distant and questionable safeguard against present dangers. We had to fight hard to get dilution carried out, and we did so because the facts daily before us proved that the munitions programme could not otherwise be carried out. But this very urgency required us to be the more vigilant, and sometimes even brutal, when advantage was sought to be taken of dilution to get behind either the letter or the spirit of the agreements which the British Government had entered into with British workmen. I remember one case in which an elderly gentleman, the head of a firm, went so far in refusing to have these things arranged with trade-union leaders in his works that he resigned his position in his firm and made over his shares to his sons, who were more in touch with the spirit of the time.

It was customary to say hard things of the men who were resisting this wholesale introduction of new workers, and it was often my official duty to take a leading part in it, but I confess that many a time in going round the shops I used to feel as much admiration for the skilled men who were standing aside and teaching others their own trade as I did for the splendid and courageous women who were taking up their share of the man's burden during the war. All the pretensions of the trade unionists were not justifiable ; but

the immense sacrifice that was made by the men at the bench was never fully recognised by public opinion.

There was one hardship which we never succeeded in removing. When the skilled man was taken off a machine on which he was earning piece-rates and put on to skilled work that could only be paid by time, or to instructing the new workers, he often received less wages than the new piece-worker whose rate of pay was maintained under the Treasury Agreement. The all-round $12\frac{1}{2}$ per cent. increase of wages which Churchill gave in 1917 to all skilled men did nothing to abate this injustice ; indeed, in some respects it made matters worse, for besides costing the country many millions of pounds, it introduced all sorts of discriminations that could not be sustained ; and the result was that the $12\frac{1}{2}$ per cent. went all round and left things in the end in much the same relative position. The time-rate earnings of the skilled man were not commensurate with the piece-rate earnings of many of the new workers, and especially of those employed on the splendid automatic or semi-automatic machines that were installed during the war. It placed him in an utterly unfair position—indeed, sometimes in a ridiculous position. We could not depart from the agreement that piece-rates should be maintained, but I cannot to this day understand the vehement objection some of the trade-union leaders entertained against the proposal which we pressed upon them time after time that a percentage of the piece-rates should be paid to the skilled men. It is true that in numbers of cases the skilled men had been moved to other shops and to entirely different processes, but it would have been perfectly possible to have arranged a factory or works pool. The introduction of that system would no doubt have introduced distinctions between those works where there was a considerable proportion of piece-work and those where there was not, and it may have been this practical difficulty—and the endless vista of troubles it opened up—that made the suggestion unacceptable to the men's leaders. It would, no doubt, have given considerable trouble ; but no proposal could be given effect to without a great deal of trouble, and it would have been worth it if we could have removed the genuine grievance of many of the skilled men.

DISPUTES

The labour disputes of the war period arose mainly from two causes, the second of which came into prominence soon after the first ceased to operate. During the winter of 1915-16 and until June, 1916, they were almost solely concerned with dilution. Afterwards they arose out of the progressive encroachments upon the exemptions and privileges of the skilled men necessitated by the

need of the Army for men. In this chapter I shall refer only to those connected with the introduction of dilution.

As I have said, good progress was made during the closing months of 1915, except on the Clyde and in some works on the Tyne, and at Barrow. On January 21, the Prime Minister made a statement in the House of Commons with reference to the obstruction on the Clyde. It was intended to give notice that in view of the urgent need we intended resolutely to go on with dilution, and, if necessary, take strong action against resistance.

An illustration of the temper on the Clyde was afforded early in October when I was visited by one of the most experienced and influential men of that district. He was not a man to lose his head, but he was full of the most dismal prophecies as to what was going to happen. He came quite unexpectedly to the Ministry and insisted on seeing me. He marched up and down my room emphasising the necessity for the arrest of a number of people, but when cross-examined he could not tell me who ought to be arrested, or what they should be charged with, but he had great faith in the proclamation of martial law. It was impossible of course to take action on a request of that sort, so we sent down Mr. Mitchell, from the Board of Trade, to make enquiries; and his report showed that, although nothing definite had emerged, the state of unrest arose out of the fear of dilution. In certain yards there was a state of suspicion and distrust that had its origin in former events and which it was exceedingly difficult to grapple with.

The first trouble broke out towards the end of October over the imprisonment of three shipwrights from the Fairfield Yard because of their refusal to pay some fines imposed by the tribunal. The trade-union leaders were very helpful over this business, and they finally obtained the payment of the fines and agreed to co-operate in an enquiry into labour conditions on the Clyde. Sporadic troubles continued during November and December, and Lloyd George determined to pay a visit to the district at Christmas. He had a stormy time: the shop stewards at first refused to meet him, but the saner men gradually got the upper hand, and not only did the stewards meet him, but he had to spend the whole of Christmas Day listening to grievances.

The following extracts from my notes indicate the course of events in these dilution strikes better, perhaps, than if they were presented only in a narrative form—

Friday, December 31 (1915).

"We had a long conference with the Engineers, as the result of which they signed an undertaking that if we would incorporate in the Bill" (Munitions Amendment Bill, then before Parliament) "power to fix wages for

unskilled workers who took the place of skilled workers, according to the agreement already arrived at (embodied in Circular L3), they would actively assist without further question or difference. On this it was agreed to incorporate the amendment in the Bill as a new clause, but I should not be too sanguine myself as to the result. . . . The fact is that the leaders are driven from behind. . . ."

Wednesday, January 19, 1916.

" . . . No progress in Glasgow. We must have a good man, if we can find one, to act as chief agent on the spot. . . ."

Monday, January 24.

" . . . A great part of Friday and Saturday were occupied with Clyde questions, first by a meeting at No. 10 with Ministers on the statement of the Prime Minister in the House, emphasising our determination to go on with dilution and the need for it. Long office sitting on the size and personnel of the proposed commissions for the Tyne and Clyde. Lynden Macassey¹ proposed. Except that he is not a Scotchman, he sounds the man for the job. The Scottish Office did not want to spare Sir Thomas Munro. L. G. on Saturday was insistent, however. Macassey, Munro and Mitchell² of the Board of Trade finally settled as the Commissioners for the Clyde. . . ."

Wednesday, January 26.

" . . . Week-end accounts are unfavourable. . . . We have decided to appoint Barnes, David Shackleton,³ and Sir Croydon Marks as Commissioners for Newcastle. They seem to be quite glad to take the job on ! . . ."

Friday, January 28.

" . . . The Clyde Commissioners got promptly on the spot. They appear to have made a good start, being looked upon as unprejudiced people. We did the right thing introducing a little fresh blood up there."

Wednesday, February 2.

" . . . The usual crop of troubles when action follows talk. The men at Lang's are out owing to the introduction of women. Nominally on the ground of our interpretation of Circular L2, which is to the effect that, if a woman is only doing part of the work of a skilled man, she does not receive his full rate of wages, but will be entitled to do so when she is able *bona fide* to do his full work. It seems only common sense, and it was the arrangement Beardmore's men asked for. Lang's men had agreed with the Commissioners to submit the point to the Ministers for interpretation, and now they have gone out on strike because they do not like his interpretation. I sent word to the A.S.E.³ Executive that they ought to repudiate the strike and help us according to their promise. They came round to see me in the afternoon, and after a long parley . . . agreed to send a telegram instructing the men to return to work. . . . We heard also through the telephone that the local organisers of the A.S.E. were trying to get the men back. I pointed out to the A.S.E. that we had specifically set up the machinery they had asked for to deal with disputes of this kind, and it ought to be used. . . ."

¹ Sir Lynden Macassey, K.C.

² Mr. Isaac Mitchell and Sir David Shackleton.

³ A.S.E. means the Amalgamated Society of Engineers.

Thursday, February 3.

" . . . News from the Clyde a little better. Beardmore's, Lang's and Weir's are introducing women. There is no trouble at Weir's or Beardmore's. Lang's men spent the day, we are told, in having mass meetings, but had arrived at no decision in the evening. . . . They have been told that we shall be glad to hear their questions on interpretation and to refer the case to the tribunal if they are not satisfied. . . ."

Thursday, February 10.

" . . . Worries from the Clyde are our daily diet, but on the whole progress is being made. The Scottish Office have arrested three men for sedition in connection with the publication of a newspaper called *The Worker*, and there was a strike in consequence. It is now fizzling out. The A.S.E. delegate in Glasgow is playing the game manfully, but he is in trouble with his own people. . . . More trouble is brewing. All we can do is to stick faithfully to our own bargain."

Tuesday, February 15.

" . . . To-day and every other day for the last week have been full up with labour troubles. . . . Dilution has got to be pressed, otherwise we shall never deliver the goods, but it is a great nuisance in the office and gives us more trouble than anything else. However, I suppose in our usual British way we shall muddle through somehow. . . ."

Wednesday, February 23.

" . . . Difficulty is now cropping up in Sheffield because of how the arrangement is working out in the case of the pay of skilled workmen. . . . L. G. and I want the A.S.E. to consider whether they cannot agree upon a scheme for maintaining the piece-rate whilst a part of it is to go to the skilled men. It seems to be only fair, but the outlook is not promising. . . ."

Thursday, March 2.

" . . . L. G. is tired of this labour job. So are we all. He wants us to put it under a separate Minister who is to provide labour for us. It is difficult to see how all the shifts and changes of munition needs can be dealt with that way. It is true that we have incurred enormous unpopularity in forcing the trade unions to dilute; at the same time, it has saved the situation, and we have got dilution well under way everywhere, even on the Tyne and Clyde. . . ."

Monday, March 6.

" . . . L. G.'s enthusiasm for shedding ourselves of our labour troubles has abated somewhat. Our men have been into it *con amore*, but it is impracticable at present to divest ourselves of power to deal with our own needs."¹

Wednesday, March 8.

" . . . The Admiralty are moving! At the invitation of Balfour I was present at a meeting of contractors he addressed on dilution. Several of them made speeches accounting for their arrears in construction. In every case it was the usual story of the wickedness of labour, exactly the same as we heard at Munitions six months ago. The fact is, however, they have

¹ A summary of the reasons which led to this conclusion is given in the Appendix, No. 7.

continued the atrocious system of paying overtime after a stated hour in the evening no matter how late a man comes in the morning, so that he gets overtime before he has put in the normal number of hours. It is a premium on coming late. Their one idea is that the Ministry or the Government in some form or other should do the work for them. This is a common experience with some gentlemen who, outside, are very vocal against Government interference. . . . There seemed to be a sort of hope that the Ministry of Munitions would take the job on for them, but we have enough on our hands. . . .

" . . . The Clyde Commissioners were over and we had a conference on progress, which is slow. . . . It seems that Croydon Marks' agreements on the Tyne are inconsistent in some respects with those negotiated on the Clyde. Some of the Newcastle terms seem to violate our pledges. More never-ending adjustments and conferences! . . . The political event of to-day was Balfour's reply in the House to Churchill, and he took the gloves off in the most astonishing way. His defence of the Admiralty on dilution was as good as it could be, seeing that the Admiralty's zeal for dilution is represented by the fact that the same evening at 6 o'clock he was having an interview with our Clyde Commissioners asking them to help them to get dilution in the shipyards. But he has his difficulties the same as we have. . . ."

Thursday, March 9.

" . . . More obstruction to dilution on the Clyde. The point is ostensibly one of interpretation, but the fact is that the skilled men are discontented over the extraordinary wages now being earned by unskilled people doing piece-work. It will cause discontent from one end of the country to the other. Sheffield tells us of a pawnbroker's assistant making nearly twice as much as the skilled man supervising him. . . ."

Wednesday, March 15.

" . . . Macassey came in from Glasgow. The more one sees of him, the more one is impressed with his value. He appears to have got hold of the situation and is being trusted to be fair, as he deserves to be. The trouble is that the Clyde Workers' Committee is a rival to the A.S.E. authority. . . . The day is not far distant when the Clyde Workers' Committee will have to be acknowledged by the A.S.E. . . ."

Thursday, March 23.

" . . . More trouble in Scotland. This time it is over the wages of labourers in steel-works. The men are kicking at a wage of 6d. an hour, and no wonder, especially as outside workmen of the same class are coming into the same yard at 7½d. and 8d. . . .

" Alarming reports have come in from Macassey. . . . The strikes at Beardmore's gun-shop and at the North British Diesel are specially bad as affecting guns. His recommendation is that certain men ought to be arrested. We can do nothing without a written recommendation and a statement of the charges, and against whom they are to be brought. I telephoned to him to draw this up at once, and, later on, after conversation with L. G., instructed him and his fellow Commissioners to come to town by the night train. . . ."

Friday, March 24.

" . . . A deputation from the Scottish steel-makers and their men. I got Sir George Askwith to hear their case and to consider the award on

Saturday morning. Neither L. G. nor I are disposed to invoke the aid of the law against labourers who are kicking at 6d. an hour. . . .

" Later on there was a full conference with the Scottish Office and War Office people in L. G.'s room on the Clyde situation. Frenzied telegrams from the Commissioners. We decided that if satisfactory evidence was supplied to the Commissioners and to the Procurator-Fiscal, we would agree to the deportation of leaders. We have been patient long enough. . . ."

Monday, March 27.

" . . . Askwith revised the Steel Labourers' Award and gave them an extra penny (!), so that there will not be a stoppage anyhow. . . ."

Tuesday, March 28.

" . . . News from the Clyde is worse, and strikes are spreading in the big howitzer shops. Men are now out at Weir's, Coventry Ordnance, Duncan Stuart's, and Albion Motors. The whole of the day practically was absorbed on one side or another on this matter. I had the whole burden of the business, seeing that L. G., the Prime Minister, and others are at the conference in Paris. Four of Beardmore's shop stewards, including Kirkwood,¹ were arrested after the decision of the 24th. I consulted Bonar Law, Balfour and McKinnon Wood on the situation, and they all agreed that it was necessary that a frank statement should be made on the subject in the House. Accordingly I drew one up, which was subsequently approved, and arranged to make it in the afternoon in reply to a private notice question.² . . . This evening, on the strong recommendation of the Commissioners, in consultation with Bonar Law, Balfour and McKinnon Wood, we decided to deport three shop stewards from Weir's. . . ."

Wednesday, March 29.

" . . . The Procurator-Fiscal sent in detailed evidence of seditious speeches on Sunday, and we have decided to arrest two men from Johnstone's. . . ."

Friday, March 31.

" The effect of our proceedings on the Clyde is wholesome. Most of the men at Weir's have dribbled back and no others have come out. The A.S.E. and the other trade unions have played the game and have issued a statement exhorting the men to return to work and repudiate the strike. . . . Tuesday evening Ramsay MacDonald, acting as peacemaker, asked me if I, privately, would see two of the leaders from the Clyde, and I finally agreed to do so in my room. They were members of the Clyde Workers' Committee, and it was arranged that Macassey should be with me. MacDonald's idea was to get a better understanding with the Clyde Workers' Committee, and it would have been all to the good if possible. Pringle came into my room with them, and in a supplementary question on Thursday referred to negotiations that were in progress on Tuesday, to which he was a party, and the suggestion was that a happy issue had been prevented by someone at the Ministry. . . . It was as irresponsible and mischievous as it could be. With the extraordinary jealousies and cross-currents between trade-union executives, shop stewards, Clyde workers, and the rest, nothing can be arranged if private talks were to be referred to in public. The interview

¹ Mr. David Kirkwood, M.P.

² The statement is given in the Appendix, No. 8.

had been friendly and entirely non-committal, but when it is shouted about on the house-tops no action can be taken. I am afraid I got across Pringle very badly in reply to Pratt's question on the adjournment, and he will not forgive me."

Monday, April 3.

" . . . The news from the Clyde is better. Pacification has not been helped by the award of the Committee on Production. Sevenpence an hour for the labourers in the steel-works does not inspire enthusiasm for arbitration proceedings. . . ."

The ultimate effect of the deportations on the Clyde was good. A number of men had worked themselves up into a frame of mind in which they were never content unless they were bringing about a stoppage or a difficulty of some sort. The cause of it all was very involved—temperament, suspicion, long-standing ill-feeling in the district, dilution, and even joy in strife. There were statements current at the time to the effect that German money or agents were responsible for some of it. There was never any evidence of it, and it certainly had nothing whatever to do with the frame of mind of multitudes of men whose sons and brothers had voluntarily joined the Colours. They were as patriotic as anybody else. I am convinced that the fine reputation Macassey and his fellow Commissioners acquired for just dealing, knowledge of their work, willingness to meet anybody and to hear any case fairly stated, had more to do with securing the quietness and good progress that ensued for several months than anything else. Macassey, particularly, seemed to thrive on labour troubles. He had, in Munro, one of the shrewdest, fairest and best-informed of colleagues, and a singularly level-headed one in Mitchell. The three of them formed a well-balanced group that did as good a piece of work on intricate labour questions as any three other men during the war.

The strikes at Barrow, in June, 1916, were due to dilution, and started because two semi-skilled men who had been doing some machine work were put on to skilled men's jobs in turning shell-punches. It was as mild a beginning of dilution as could conceivably have been made, but it brought 5,500 engineers and allied tradesmen out on strike. We sent Macassey to deal with it, and he dealt with it in a masterly fashion. At first he was refused either a hearing or a meeting; at one mass meeting, indeed, Messrs. Rose and Wilson, members of the executive of the A.S.E., were also refused a hearing. They had been sent down to tell the men that the strike was unjustifiable and to advise them to return to work. However, by insisting on attending the meetings and having his innings, Macassey gradually got hold of the situation. His report showed that ignorance

of what was involved and of what had been arranged had more to do with the stoppage than anything, and his firmness and frank dealing soon got the men back to work.

In conclusion, I cannot resist incorporating a note relating to the withdrawal of the order deporting some men from the Clyde after the period of peace that followed there—

Tuesday, August 1.

"Another subject of discussion amongst us lately has been whether we should allow any of the deportees on the Clyde to return. I had a deputation from the A.S.E. strongly recommending that they should—at least some of them—be allowed to return, and I am inclined to agree. I think it would be a wise course to take. However, this week the Scottish Office people took it into their heads to object, and we had a meeting with them to-day, at which Jack Tennant (newly appointed) entertained us in the most highfalutin' manner and informed us that he was responsible for good government in Scotland and had strong views on that subject. The fact was, of course, that he did not know the least bit about it, and I am afraid I was obliged, with a considerable measure of bluntness, to point out to him that the Ministry of Munitions had had to face the music from the start to the finish and to do all the work, and that we should also have to face any trouble that arose by allowing any deportees to return, if it did arise. I might have told him that when originally I had to make the statement in the House on the deportation question, McKinnon Wood made me take out of the proposed statement the fact that the Scottish Office had agreed to the course proposed. . . . The Scottish Office have sheltered themselves behind us all the time and have never been prepared to take any initiative."

CHAPTER XIV

LABOUR AND MAN-POWER FOR THE ARMY

Improved Relations—Progress of Dilution—MAN-POWER FOR THE ARMY—Recruiting Troubles—Labour Uncasiness—Badges—Further Limitations—The Tribunals—Increase of Munitions Demands—Debadging—Montagu's Criticisms—The Ministry ceases to Debadge—Macready's Proposal—THE MAN-POWER BOARD—Derby's Committee—Chamberlain and Middleton—Trade-union Cards—Proceedings of the Board—Ill-considered Projects—The Trade Card Scheme—Montagu's and the Author's Criticisms—Skilled Men exposed to Recruitment—The Sheffield Strike—The Trade Card Scheme.

THE conclusion of the Clyde strikes really marked the ending of the long-drawn struggle over the principle of dilution. During the summer of 1916 our relations with organised labour became increasingly cordial. This was due in the first place to the fair way in which employers generally, in consultation with their workpeople, sought to apply the principles which had been agreed upon. Equally it was contributed to by the skill and fairness displayed by men like Macassey and Munro, and by the great body of men in charge of the processes of dilution in the shops, as well as by Henderson's Committee and the men at Headquarters. The work of the Ministry also in promoting improved working conditions and welfare enterprises served to strengthen the feeling of mutual confidence.

During this period, however, the demands of the Army for men grew more and more insistent and involved continual curtailments of the list of reserved occupations, so that the trade unions were constantly asking us to furnish them with precise statements of the rights and privileges of their skilled members who were grouped in scores of classes with a great variety of exemptions according to age and occupation. It was not so much the Ministry of Munitions that was concerned as the general needs of the Army for men, but, as the Ministry had been made responsible for the issue of badges of exemption for the War Departments and were parties to a complicated series of trade agreements with the different trades, we were necessarily involved.

The Military Service Act of January, 1916, and the Derby

Scheme, were much more meagre in their results than had been anticipated, so that when Robertson submitted a statement in April, 1916, of the men necessary to keep sixty-four divisions in France until the end of the year he had to report that the numbers obtained were inadequate. It appeared that, of the 197,000 men called up under the Military Service Act, not more than 57,000 had responded ; and that out of the men attested under the Derby Scheme, less than 200,000 had been forthcoming since Christmas, and it was impossible to obtain the extra men required by any mere combing out of occupation lists.

The political effects of these man-power questions will be dealt with separately, but they had to be examined for the purpose of ascertaining whether any feasible alteration in the system of exemptions could be devised which would set more men free. In my Report to Lloyd George on this subject, I urged that a close examination of recruiting methods was necessary before any wholesale modification of the existing system could be justified. Why was it, for example, that only 57,000 out of nearly 200,000 men had responded ? Where had the rest gone to ? Was the machinery incompetent to keep trace of the men that had been called up ? We knew that sometimes only a small proportion of the men whose exemptions had been withdrawn were actually enlisted, and the diary note of April 17 is as follows—

" I must say that a closer examination of the facts makes me sceptical as to whether with the present incompetent War Office machinery we should be any more likely to get the men required under another system. We are not getting the men who are available ; and the more one studies the issue, the more satisfied I am that the really important thing is to give Macready and the other men with brains at the War Office a real chance, for, at present, recruiting is a hopeless muddle and involves us in continual difficulties apart from its political implications."

General Sir Neville Macready's department was greatly strengthened during the summer of 1916, and under his energetic direction, with the aid of Sir Auckland Geddes and other men, it became a very efficient department ; but some facts which afterwards came to light fully justified the early misgivings.

The following note of May 17 shows one of the causes of leakage of the men whose badges had been withdrawn—

" I had a talk with Macready and Auckland Geddes on the arrangements for recruiting the men we release from munition work. The recruiting officers at Gretna and elsewhere have been taking up the absurd position that they can only enlist men, whom we release, who are registered in their district. Seeing that this does not apply to more than 5 per cent. of the men released there, and leaves the remaining 95 per cent. to float about the country

anywhere, it is useless for us to draw up lists on that basis. Both Macready and Geddes agreed as to the absurdity of this arrangement, and undertook to try and fix up something that would be really effective. These two men are beginning to get something into shape in the recruiting organisation in place of the unholy muddle that has been so maddening hitherto."

Another illustration was afforded afterwards in a Report of Sir Mortimer Durand, who was the chairman of a committee known as the Badges Committee, and had charge of matters affecting lists of reserved occupations and exemptions. In a Report in July to Mr. Walter Long, as President of the Local Government Board, Durand said

"that under the provisions of the Military Service Act the man whose certificate was withdrawn was not considered to be enlisted until after fourteen days, and in the majority of munition, Admiralty, and other skilled workers there was a period of grace of two months. During this time a large number of the men obtained employment elsewhere, and, as a matter of fact, the number that the Army recruited was quite disproportionate to the number of those whose badges had been withdrawn."

These extracts will be sufficient to suggest how it was that, with the extension of the Military Service Acts in 1916, dilution questions began to be replaced in our conferences with organised labour by those affecting Recruiting. A note of April 28 is interesting as showing that, even at that time, the question of Badges was coming to the front as a leading issue—

"Yesterday morning, in place of Long and Lloyd George, I had a prolonged sitting with the National Advisory Committee and the A.S.E. Executive on badges, grievances, deportees from Glasgow, and the old wrangle about the interpretation of Circular L2 on Women's Wages. We made a satisfactory arrangement as to badges. As to deportees, whilst thoroughly friendly, I had to remain firm. I finally persuaded them to abandon their squabble about interpretation and try to fix up agreements in the shops with Macassey direct. I found afterwards that they had come with a resolution in their pocket to the effect that the Minister should withdraw his interpretation of the Circular, and, failing that, they were to withdraw all their members from Government Committees and all assistance throughout the country. This, as a matter of fact, would have split their Executive, but the *fixing up of a satisfactory arrangement on badges avoided the presentation of this ultimatum.*"

During this period, also, the conditions of service of men released from the Colours, temporarily or otherwise, to help with urgent war-work, began to enter into discussions, and a note of June 14 may be taken as typical of the kind of incident that was frequently cropping up—

"There has been a good deal of trouble over a batch of enlisted men who were sent to Chilwell under conditions that cut across our agreements with the trade unions, and Eric Geddes" (who was then dealing with Filling)

"agreed with me that it was hopeless to move these men about in a casual way and in ignorance of the arrangements which had been made.

"To make matters worse, it is now proposed by the W.O. that all the men released from the Colours should be transferred to a Workers' Reserve under conditions which will deprive them of their separation allowances and take them out of the conditions on which they voluntarily agreed to form movable squads of labour. If this proposal is persisted in, it will mean more confusion and ructions. The only point in having these men specially grouped is that they can be used where they are wanted in emergencies. I am getting together a special memorandum for Lloyd George over the weekend, and shall urge him to bring it up at the Cabinet. All these things make an increasing amount of difficulty between our men and the War Office, but more particularly with the trade unions, who watch with a jealous eye the conditions of men in these special labour units, looking all the time for something which could be described as compulsory labour."

Incidents of this kind acted as irritants, but intenser aggravation was caused by the repeated compulsory enlistment of skilled workers who were possessed of badges and other certificates of exemption.

Under the Munitions of War Act, badges of exemption were issued by the Ministry of Munitions to munition workers directly, and, as agents, to workers for the Admiralty and other War Departments. In addition, exemptions were provided by the local tribunals and by the recruiting officers, and the growing volume of these exemptions was naturally watched with a jealous eye by the Adjutant-General's Department, as well as by the public and the trades themselves. By September, 1916, there were some two and a half million people in possession of badges or exemptions of one kind or another. Some 350,000 of them were over military age and may be disregarded. The remainder was made up as follows—

	A Munition Workers.	B Admiralty Workers.	C War Office Workers.	Totals.
(1)	504,000	324,000	72,000	900,000
(2)	Old Admiralty Badges			140,000
(3)	Protected by Tribunal Certificates			926,000
(4)	Protected by Recruiting Officers' Certificates			415,000
				<u>2,381,000</u>

The Ministry of Munitions, as such, had no knowledge of the grounds of exemption of those dealt with by the tribunals or by recruiting officers, and our chief concern was the 500,000 men that we ourselves had been responsible for the protection of. The Badges Committee and those responsible for the administration of the parts of the National Service Act that came under Long's authority at the Local Government Board were involved in their own tangle

of trade classifications, gradings and exemptions. We only had the echo or reverberation of their proceedings so far as they affected the arrangements we ourselves had entered into with trade unions.

From July, 1916, onwards, however, it became necessary for us to watch more jealously than ever the inroads that were being made upon the lists of exemptions. It was all very well, for example, to talk of debadging unskilled men below thirty years of age, but when the steel programme was worked out in terms of the augmented programmes of July and September of that year, we found that the steel required for our own programme and for the Allies was increased by some 20,000 tons per week. When this had been resolved into its labour equivalent, it appeared that we needed 40,000 more men in coal-mines and at the coke-ovens, from 7,000 to 9,000 additional men for the increased production of pig-iron, apart from 3,000 extra limestone quarrymen and an equal number of silica brick manufacturers; and these requirements were additional to the labour needed for the completion of the thirty-nine extensions of different steel-works then in course of construction. Work of this kind could only be done by hefty young men in the prime of life, and when, say, a young labourer had finished his job in one place, the Ministry had need of him in half a dozen others.

The net effect of these growing demands was that during the first eight months of 1916, notwithstanding considerable supplies of new labour by training, dilution and otherwise, the demand for new labour, added to the normal wastage through recruiting, sickness and other causes, resulted in a situation in which the unsatisfied demand remained as great as ever. In January, after the most careful scrutiny, it had been reduced to 36,979; but in September the corresponding figure was still 35,000 in addition to the demands of the enlarged programme just referred to.

We therefore became more stubborn still when Robertson unfolded the increases of the new gun and other programmes, for it then appeared that we were called upon to provide, above the previous enormous orders, an extra 300 six-inch guns, an extra 400 six-inch howitzers, and other corresponding augmentations of heavy gun production. The daily shell ration for heavy guns was also put up so that an additional 300,000 completed rounds of ammunition were needed each week, and it involved the production of 1,600 additional tons of explosive per week and the employment of from 6,000 to 8,000 additional skilled men, and 12,000 to 16,000 unskilled men or women, apart from the extra labour in the gun-shops, shell-shops, and filling factories. About that time, also, we were ordered to take over the whole of the motor transport supplies, and the British Army put forward a great programme of heavy

lorries, motor-cars, ambulances, and the rest, with an urgency order of 750 heavy caterpillar tractors, as well as 5,000 two or three-ton lorries for Russia and many other trimmings.

Sir Albert Stanley (Lord Ashfield), whom we had then secured as Director of Motor Transport Supply, had not worked out the requirements of the new motor transport programme in terms of men, but it would evidently run into big figures, and, in addition, it had then become a practical certainty that we should soon be charged with the production of aeroplanes.

THE MAN-POWER BOARD

It was no wonder, therefore, that in the controversies of the autumn of 1916 which led to the establishment of the Man-Power Board, Montagu, then Minister of Munitions, became increasingly pungent and forcible in his criticisms of the various debadging proposals that were made from time to time. It needs little experience of office or official life to understand also that under these circumstances we found ourselves engaged with the Adjutant-General's Department in a friendly, if strenuous and continuous strife. Macready was a tough fighter, and he and I had many battles, but we were out to fight the Germans and not one another. Sometimes I used to point out to him, when he was particularly difficult and would give his eye-glass an extra screw to look beyond me at nothing, that he ought to settle things first with his own Chief of the General Staff, who was bludgeoning us for more guns, instead of wanting to take away some of the men who were helping to make them. There was little doubt that several men were in possession of badges who ought not to have them, but the difficulty was to find out who they were, and we could afford to run no risks in the loss of essential men. On our part we did not fail to point out that there were a good many men wearing khaki up and down the country, sitting on office stools and in observation stations and elsewhere, to whom a small-tooth comb might be applied with advantage, and we were insistent that the Army should make a better use of the men it had before further endangering the supply of the munitions on which it itself depended.

The position at the steel-works became so acute in July that, with Montagu's permission, I instructed the Badging Department not to debadge any more single men over the age of thirty, or any married men if suitable for work in the steel-works or shipyards, if they were prepared to accept that employment. Later on, we temporarily suspended debadging altogether, insisting, as regards certain industries, that we could not afford to debadge workers unless a substitute of some kind was available. This action of ours

brought matters to a head and led to a meeting on August 2 at which the proposal for the establishment of a Man-Power Board was introduced.

An extract from the note of the meeting is as follows—

" There was a meeting in Lloyd George's room at the War Office, including Lloyd George, Derby, Long, myself and the usual officials, with the A.G. and his staff. The long and short of it was that the A.G. put up a proposal that there should be a small independent body consisting, say, of a Cabinet Minister, and one or two others competent to decide disputed questions. I was inclined to welcome it, not quite, I am afraid, for the same reasons as the A.G., but because I am quite sure that not only in our own occupations, but in the Army itself and in the Naval establishments, there is a gross waste of men, with all sorts of more or less skilled people still doing ordinary work, and such a body as is suggested will probably require each one of us to undertake a vigorous combing-out."

Macready, however, submitted a proposal under which a Supreme Man-Power Board, with local agencies, would be empowered to decide all questions with regard to man-power, and to regulate the number of men in civil works, munition factories, mines, and elsewhere through Local Inspection Boards, and that this body should have complete control over exemptions of every kind. As soon as a proposal of that kind was examined, it was found to involve complete industrial conscription and legislation of a far-reaching and most controversial character. Apart from these considerations, however, Montagu in a forcible memorandum stated our view that the proposal was impracticable in itself. We ourselves had spent two years in establishing a large and complicated machinery, employing hundreds of persons for the purpose of securing the proper employment of labour in engineering works alone, and none knew better than we did how imperfectly it was still functioning, but every stage of it had raised a complicated and involved set of questions. How much more would this be the case if attempts of the same kind were to be employed in the whole realm of industry! What was wanted was not so much a proposal of this sort, which, even if it were practicable, would require a very long time to get into operation and would certainly not suffice to meet the needs of the present situation, but a body competent to settle the rival claims between different departments and to give instructions on the policy to be pursued.

We ourselves had been subjected to a continual scrutiny, and believed that if, in addition to the progressive application of the Military Service Acts, the same scrutiny were applied to the use of men in the Army and by the Admiralty as well as to tribunal and other exemptions, the needs of the case would be met without any blind debadging or other similar orders. Moreover, any such

orders in many trades would be a leap in the dark, and would, as we knew only too well, lead to endless controversies and difficulties. Most important of all was the consideration which I may quote from the last paragraph of a memorandum on the subject which I prepared for Montagu—

"In all these matters it must not be forgotten that there is a vast reservoir of male and female labour not used at present in essential services which by training and in other ways might be made use of to fill existing vacancies. The experience of the Ministry of Munitions warrants the statement that it would have been impossible to produce munitions on the present scale had not energetic and comprehensive steps been taken both by training and by the methods commonly known as dilution, to bring into its services great masses of labour which hitherto had been outside the scope of the industries concerned."

In consequence of this meeting of August 2, Macready's memorandum and our alternative proposals were circulated to the War Cabinet. The general idea of a Man-Power Board was approved on the understanding that it should be a body without executive powers but competent to examine and decide upon the issues that had arisen and to require the departments to act accordingly. Lord Derby, myself, Macready, Llewellyn Smith, Sir Graham Greene and Sir Edward Troup were deputed to draw up the terms of reference to this body. We had little difficulty in doing so, and we recommended that the Man-Power Board should be competent to determine all questions arising between the departments relating to the allocation and use of man-power for the successful prosecution of the war and to be authorised to direct departments to create any necessary arrangements. The Board also had authority to require the fullest information to be supplied to it. There was no difference of opinion amongst us that it would only lead to trouble and failure if we were to encourage the formation of some new executive body which was to have set before it the impossible task of telling everybody in the country exactly what they ought to be doing.

The Man-Power Board was accordingly set up with the foregoing definition of its duties. Mr. Austen Chamberlain, as a Cabinet Minister, was appointed Chairman, and Lord Middleton was his right-hand man. I do not think that many weeks passed before every one of us who had been parties to the proposal had regretted our action.

It was of the utmost importance that action should not be taken without regard to the pledges of the Government to organised labour, including the important one given by the Prime Minister on September 28. He had received a deputation of trade-union

representatives who came to complain of the constant enlistment of skilled men despite undertakings to the contrary. The Prime Minister's statement to them ultimately proved to be of great importance, and should be quoted. It was to the following effect—

“ Skilled men (by which I mean men who, from natural ability or training, or a combination of both, have special aptitude for particular and indispensable kinds of national work here at home) ought not to be recruited for general service.”

From the very beginning of its work the Man-Power Board displayed a singular disposition to issue drastic recommendations without sufficient enquiry either as to how they could be carried out, or what effect they would have upon existing obligations. The First Report, issued towards the end of September, made a modest beginning in this respect. It issued directions with regard to certain classes of men to whom no badge certificates should be given, and at once cut across an important agreement that had been come to by the War Office and a Trade Union Committee, under the chairmanship of Mr. G. J. Wardle, M.P. On the initiative of this Committee an arrangement had been made between the War Office, ourselves and the skilled unions that where a skilled man in certain defined trades was not in possession of a badge certificate, on condition of his enrolling as a war munition volunteer, he was to receive from his union a card specifying his trade ; and it would then become the duty of the Ministry to place him in an establishment on war-work where he would become entitled to the possession of a badge certificate. This trade card exempted for six weeks but not longer, and the process of transfer was to take place within that time. The arrangement was working very well and was helping us to get a useful body of skilled men from non-essential work on to munitions. At one stroke the First Report of the Man-Power Board rendered the whole of these transitional cards of no validity whatever, although they had been given to carefully selected men for the purpose of their transfer to munitions work. It was a small matter, and was easily adjusted ; but knowing the very tricky ground that the Board had to cover, we all were very apprehensive as to what would come when they had got into their stride. We had not to wait long.

During October an arrangement was made to cease badging pending the preparation of detailed proposals by the Man-Power Board. In view of the first serious oversight of existing arrangements, I interviewed the Board on behalf of the Ministry on October 17, and they agreed, before formulating proposals in future, to afford us an opportunity of expressing our views upon them. Seeing that we had been doing the whole of the work of dilution, substit-

tion, badging and the rest of it from the beginning, it was clearly advisable. In the rush and hurry, however, to do something dramatic, this undertaking was lost sight of, and, indeed, only four days later, in a private letter from Graham Greene, of the Admiralty, we had warning of proposals the Board were contemplating. The receipt of them, somehow, by the Admiralty, had given so much alarm that they were anxious to know what we thought about them. Thanks to this warning, and only on this account, we obtained foreknowledge of the proposals of the Man-Power Board as set out in their Third Report, of November 9.

This Report tore up existing arrangements wholesale and evoked from Montagu, on our behalf, some of the most passionate and forcibly worded remonstrances and memoranda that I have ever seen included in official documents. Chamberlain and Middleton apparently had arrived at certain formulæ; and they were to be applied *willy-nilly*. All men under twenty-six years of age were to be decertificated immediately, except that not more than 33 per cent. of the men in any establishment were to be called up, but no skilled men were to be called up although thus decertificated, and no men at all in certain specified industries, particularly metal trades and shipbuilding. By this procedure 80,000 general service men were to be produced from the Admiralty and munition trades within two months. What was to happen to the output required from the establishments affected did not appear to have been considered, but so far as the numbers themselves were concerned, we found that in the non-excluded trades there were only 164,000 badged men, all told, under twenty-six years of age, so that, theoretically, half of these men were to be got rid of within two months. But there was an accompanying condition that none of the men to be called up were to be "skilled" men, and it appeared that some 70 per cent. of the 164,000 young badged men were skilled men, moreover, when we had excluded the skilled men and the men in the metal and other excluded trades, there were only a little over 50,000 unskilled men all told under the age of twenty-six who were in possession of badges. But not more than 33 per cent. of the men were to be taken from any one establishment; so that where the 80,000 were to come from passed our understanding.

The machinery by which this was to be done was to divide the country into seven areas, and a district referee, who, wherever possible, was to be a superintending factory inspector, was to be appointed to decide in the case of any difference whether a man was to be taken or not. There was nothing to show that these gentlemen would have any knowledge of the need for the output on which the men were engaged, or of the bewildering network of

trade-union and other obligations that had been entered into. They were to be placed in complete authority over the Military and Munitions representatives of the district. The Board thought it "necessary that a duly appointed representative of the union should be authorised to represent to the district referee any case in which the union think that one of their members is being improperly included in the unskilled or semi-skilled classes"; but on this point also "the decision of the district referee should be final."

It is no exaggeration to say that if we had attempted to work this astonishing system, so light-heartedly proposed, there would have been a stoppage of production from one end of the country to the other within a week.

As a sort of aside, the Board recommended another scheme which later on had disastrous consequences, as many of us prophesied at the time. They suggested that the unions should issue cards to their fully skilled members, and that no man possessing such a card should be called up until his case had been submitted to the district referee. "The Board recommend this proposal for adoption. The form of card to be used should be submitted for the approval of the Man-Power Board."

This was the beginning of the famous "trade-card" scheme, and it will merit separate description. The Board gave it its blessing without any serious enquiry into what it involved, and certainly without any consultation with the men in the departments who had been labouring at these trade questions for so long, or with anyone else who knew anything about the business, so far as we could ascertain.

To return, however, to their main proposals, it appeared that not only were there less than 80,000 unskilled men all told in the available trades amongst the young badged men, but that the debadging would not by any means ensure that the men would thereby become enlisted in the Army, for of those who had already been debadged, not more than 30 per cent. had become enlisted, so far as they could be traced.

In his memorandum, Montagu was very severe upon the Man-Power Board for the total disregard they had displayed of the obligations cast upon us by the September programme of increased munitions production. Some of them have already been referred to, and it is sufficient to say here that by November we had ascertained that the augmented ammunition gun and other programmes meant a prospective demand for an additional 171,000 men and 76,000 women. Apart from this; how was the district referee to know whether workers could be spared or whether the output of a given shop was important or not? He could not know whether it was

included in the supplies that were urgently needed or not, for it was impossible to imagine that the highly secret arrangements between the heads of the Ministry and the War Office as to supplies could be divulged to these referees any more than they were to our own district officers who were simply advised from time to time as to the urgency of this or that supply. Moreover, the fact that a man could be released at one shop, say, in Sheffield, was often only a reason for our welcoming the opportunity of moving him, say, to Leeds or Renfrew, in order to augment the output there. But as Montagu expressed it, he, as Minister, would be

"left in the position of saying to the Army Council: you cannot have as many 6⁴ shell as I promised you because an outsider has reduced the output and I can never tell you how many you will have in any week because I never know what may be done to labour. Labour supply is so essential and universal an ingredient in the manufacture of munitions that unless the Minister of Munitions can control it he cannot give or be responsible for any estimates for supply."

In point of fact, there were in existence the most elaborate arrangements, which had their origin in the deliberations of the Priority Committee as to the movements of labour from one place to another according to urgency, and none of this knowledge could possibly be at the disposal of the referees blindly operating with some 33 per cent. rule in obedience to the dictates of the Man-Power Board. It was true that a number of the unskilled young men could be spared if substitutes could be found, but they might be spared more easily from one shop than from another, for everything depended upon the relative urgency of the supplies. We had already had a good many experiences of the incidents that were likely to arise with regard to the men who were not to be recruited but who were to be left without any badges or certificates of exemption at all; and a goodly number of disputes or threatened strikes were continually being adjusted between ourselves and the War Office in cases of this kind.

Finally, it was impossible to separate the processes of dilution and substitution from enlistment questions, as the following excellent descriptive note, supplied by Montagu, showed—

"The process of dilution is as follows—

"Meetings are held with the trade union or trade unions concerned to induce them to accept the principle. After negotiations, which often last for many days, a general agreement is drawn up, of the kind of which a comparatively simple specimen is attached. . . .

"The next step is to apply this general agreement in detail to every shop. Meetings are held with the shop stewards and with the individual workmen. A complete list is drawn up of all the operatives employed in the shop, with a full account of the operations which they perform.

" Discussions then take place as to the operations on which skilled men can be replaced by semi-skilled or unskilled men, or by women. A specimen is attached of a part of one of the schedules relating to the airship shed at Vickers' works, Barrow-in-Furness. The success of the scheme henceforward depends largely on the technical efficiency of the descriptions of the operations selected for dilution."

The district referee could not have any knowledge of all the detailed technical and other questions, agreements, pledges, understandings, and the rest which had been developed as a part of this process, and it was silly to expect that the organised trade unions who had entered into obligations with the Government, from the Treasury conference of March 1915 onwards, were going to accept as final the decision on some thorny and difficult point of a local referee who knew nothing whatever about it.

The Deputation to the Prime Minister of September 28, the unanimous testimony of the Advisory Committee and of all other men who were in touch with what was going on in the workshops, told us that improper enlistment was a growing cause of anger and unrest. The first day any district referee got to work he would find his decisions affected a whole crop of matters connected with dilution and substitution and be confronted with a whole body of workshop and other agreements affecting records, allowances and so forth that were an essential part of the process of dilution and the faithful observance of which had been vital to the immense success which had been obtained. He could not be familiar with all this highly technical work, and I think that the matter was fairly summed up in the concluding paragraph of my own memorandum to Montagu upon the Report, which was as follows—

" The memorandum of the Man-Power Board has been drawn up without any consultation with the Ministry of Munitions, and as one of those who has been responsible for carrying on this highly difficult and complicated work throughout the country, it is necessary to observe with much regret that it bears on its face almost from the first line to the last an entire unacquaintance with the nature and the conditions of the work."

It was obvious to all of us at the War Office, the Admiralty and Munitions that the Report of the Man-Power Board was an impossible document. An alternative working arrangement was therefore designed between ourselves and the War Office, and was approved. It was to the effect that not only unskilled but semi-skilled men up to thirty years of age should be debadged as quickly as possible provided that the man should not be called up unless he were fit for general service and unless a substitute were found for him in cases where a substitute was essential in the interests of output.

But the publication of the first Report of the Man-Power Board, the temporary cessation of debadging and the whole proceedings of the Board added to the existing ferment, and a further set of instructions, limiting any fresh issue of badges and recommending the extension of dilution to private and commercial work, made the temper worse than ever.

The growing unrest led to a meeting of the unions with Henderson as the Government's Labour Adviser, and he was confronted with strong protests as to the continued enlistment of skilled men and forcible requests to the effect that if badges were not to be respected some alternative which labour could work and understand must take their place, for the orders of the Board as to the stoppage of badges and the withdrawal of certain exemptions were contrary to the spirit and intention of the Prime Minister's pledge. The dispute came to a head in November and a serious strike took place over the compulsory enlistment of a skilled man named Hargreaves from one of Vickers' shops in Sheffield. The Government was driven to devise some substitute for the badge system, that was becoming valueless owing to the performances of the Man-Power Board. The Trade Card Scheme emerged as the result.

The Hargreaves episode proved to be of far-reaching importance, and a note of what happened, as made by me on Saturday, November 18, is worth recording as the first indication of the acute crisis that developed in 1917—

"As we had foretold at the War Committee when we lodged our objection to the issuing of the Man-Power Board's instruction to cease badging, the result would be that a number of skilled men would be enlisted and sent into the ranks despite the Government's most explicit pledges and undertakings. . . .

"The deputation to the Prime Minister cited a large number of such cases and there have been many more since then in steel works and elsewhere. . . . The unions kept coming to us, only to be told that we were prohibited from issuing badges. They could get no satisfaction out of the War Office, and the Man-Power Board, pursuing their course of colossal stupidity, did nothing either.

"The result of this irritation came to a head in Sheffield on Wednesday, the 15th, in a threat of a strike if a certain man named Hargreaves, a skilled man, recruited from Vickers', was not returned. This was only the last straw, as there had been several cases in Sheffield where skilled men have been recruited and put to all kinds of menial work. We did our best with the War Office on Thursday, but did not get very far. On Thursday evening, 70,000 men came out at Sheffield, and it was at last realised that these idiotic recruiting performances raised a serious question and the return of Hargreaves was authorised.

"Derby took the matter in hand and was as keen as could be all through. An Emergency Committee of the War Council, which several of us attended, was held on Friday morning, and there was no question as to the cause of the

trouble. The A.S.E. had a big meeting with all their delegates in attendance and it was arranged that Henderson should try and promote a meeting between them, Montagu and the Ministry people, Derby and Geddes of the War Office, with Chamberlain as Chairman of the Man-Power Board. We met them at 2.30 and proposals emanating from prescient M.P.B. were submitted for allowing them to issue cards to their skilled men as a surety against their enlistment on condition that all their members not on war work became munition volunteers and the requisite number of men as artificers were found for the Army. There was a meeting with the War Office at five o'clock and again with the unions at 6.30. They had an adjourned meeting on Saturday morning to consider the proposals and met at 2.30 on Saturday afternoon, when an agreement establishing this Trade Card System was signed by Chamberlain, Henderson and Montagu, and representatives of the A.S.E. . . .

"It marks an enormous departure and a grave one, and is a great feather in the cap of the unions. . . .

"Hargreaves was returned to Sheffield on Friday evening, and the men are to resume work on Monday. This escapade has lost us the output for four days of the big armament shops in Sheffield. Lloyd George was away in France at the Conference at Chantilly all the week. Derby was a bit nervous at pledging the War Office, but he took the responsibility for doing so."

Stephenson Kent and the men in the Labour Department pulled wry faces at this new departure and it was not many days before the number of unions authorised to issue Trade Cards was extended. At a meeting at the War Office on November 22, it had to be admitted that other unions contained large numbers of skilled men just as essential as those included in the membership of the A.S.E., and they must be entitled to issue cards also. An agreement with twenty-four further unions, therefore, giving these privileges, was signed at this meeting by Henderson, Derby, and myself, on behalf of the Government.

In this way, at the end of November, 1916, the country became committed to the Trade Card Scheme. The subsequent history of this ill-starred venture and the difficulties it evoked—not for the august members of the Man-Power Board whose antics had led to its creation, but for those of us in charge of the daily work—will fall into the story of the year 1917. For the moment it gave us respite from the unrest arising from improper enlistment, but I cannot find any record in my notes, nor can I recall any occasion at that time where any man or woman of experience and responsibility did anything else but issue warnings as to what it would lead to.

The explanation of it all is that the Man-Power Board under Chamberlain and Middleton was presided over by men who dwelt—as they always have dwelt—in a region of formulæ and were without constructive ability. Something was desirable, therefore

people ought to conform to it. If they did not, it was their fault. It might be a good thing to make them. But how the thing was to be worked ; who would work it ; how the people would be made to conform, if they had to be made ; and what calamities would arise in the making, were questions which never appeal to men of this type of mind.

CHAPTER XV

LABOUR AND CONDITIONS OF EMPLOYMENT

The Ministry's Opportunity—Employment of Women—Herbert's and Morgan's Forecast—HEALTH OF MUNITION WORKERS—HOURS OF LABOUR—Overtime and Output—Sunday Rest-day—CANTEENS—WELFARE—Work of Rowntree and Others—Duties of Supervisors—Work of Hyde—Adoption by Employers—HOUSING—Work of Carlisle and Holloway—WAGES—Important Circulars—Women Workers' Deputations—Summary.

THE Ministry of Munitions as a manufacturing and employment agency was in a unique position. Never before had the State assumed such extensive responsibilities for directing and originating production. Many political prejudices and traditions seemed for the time being to have been consigned to the scrap-heap, and amongst those who urged us to take the most drastic proceedings and to engage the most extensively in State ownership and manufacture were men who, all their lives, had belonged to the Conservative Party, and belong to it still. Time after time Lloyd George and I had to put the brake on, and whatever may have been our deficiencies from a lack of experience in business, there is no doubt at all that political experience and a sensing of the difficulties that would arise from the social and domestic effects of what was proposed often saved us from enterprises that would have been publicly unacceptable. Many a time when some of our splendid business men were urging us to take some drastic course or other they were pulled up with this sort of reminder: "Just think what your proposal would mean in its working out? How would you like it if it were applied to you? How many times have you yourself denounced Government interference?" The Ministry's action was often denounced as socialistic, but whatever criticisms it may have received on that account were as nothing to what they would have been if we had adopted some of the schemes pressed upon us. The explanation was that individual interests, except for the disgusting profiteer class, had been merged in the one overwhelming national purpose—to win the war. It was a habit at that time—indeed, sometimes it was almost a mania—to expect the State to do everything.

These State-directed enterprises, however, provided another kind of opportunity, and Lloyd George and I agreed from the very beginning that as soon as ever there was a moment's breathing-space, use ought to be made of the exceptional situation to secure a better and more humane standard of working conditions.

Multitudes of new workers would be brought in and we should be compelled to take and exercise extensive powers, but I cannot say that before July, 1915, I had begun to visualise the vast extent to which women might be brought into munitions work and the character of the problems their introduction would bring up. The first clear and emphatic premonition of what might come is recorded in my notes of August 12, after an office conference with Henderson, Mosses, and Brownlie from the Advisory Committee, with Wolfe and Morgan from the Labour Department, and with Herbert from the Machine Tools Department. The genesis of this particular *ad hoc* conference is a little obscure, but the outstanding fact of it was that Herbert and Morgan emphasised the vast possibilities of the extensive employment of women in munitions manufacture, and a very little reflection sufficed to show that their recruitment would involve us in many new responsibilities.

As our minds began to turn more and more towards an active campaign on Dilution we began to recognise the responsibilities it would entail in prescribing the conditions of employment of the new workers, and the importance of establishing some machinery for making a sensible and proper use of so great an opportunity became obvious.

The first step was taken by myself on August 9, three days before the office meeting already referred to, although I confess that the full possibilities of its value had not emerged before the meeting of the 12th. On that day I held a meeting with the following gentlemen—Sir Thomas Barlow, Bart., the physician ; Mr. Bellhouse and Dr. Collis from the Home Office ; Sir George Newman from the Board of Education ; Sir Walter Fletcher from the Medical Research Council, and Professor Boycott. I see that I expressed our aim in the following somewhat modest terms—

“ That it might be worth while in our endeavour to increase the output of munitions to see whether something could not be done to sustain and improve the physical efficiency of the workers, to examine the supply of food, facilities for meals, hours, fatigue, ventilation and kindred matters.”

There was no doubt amongst those present as to the value of the opportunity ; the only question was as to how it could wisely be used. The sequel of this meeting is recorded on September 19 as follows—

" It has become manifest that the new varieties of occupation in connection with explosives and dangerous materials and the introduction of women and unskilled workers into all sorts of work will soon bring up a number of questions affecting the health of workers, and I asked Lloyd George to let me appoint a number of people whose sole business it would be to make enquiries and to give us advice on matters affecting the health of people employed in munition works. He agreed to give me a free hand in the matter, and during the second week of this month ' The Health of Munition Workers Committee ' was formally constituted under the chairmanship of Sir George Newman, and consisted of the following persons—

Sir George Newman, M.D. (Chairman).
 Sir Thomas Barlow, Bart., M.D., etc.
 G. Bellhouse, Factory Department, Home Office.
 Professor A. E. Boycott, M.D., F.R.S.
 J. R. Clynes, M.P.
 E. L. Collis, M.B., Factory Department, Home Office.
 W. Morley Fletcher, M.D., F.R.S., Medical Research Committee.
 Professor Leonard E. Hill, M.B., F.R.S., Medical Research Committee.
 Samuel Osborn, J.P., Sheffield.
 Miss R. E. Squire, Factory Department, Home Office.
 Mrs. H. J. Tennant."

We were careful from the very first that there should be nothing of the "high falutin" about the proceedings of the Committee, although we hoped that, in addition to dealing with problems of the immediate present, something might be produced which would be of permanent benefit to workers and to industry. To quote Newman's own words—

" The Committee throughout their enquiries consider that their primary duty is to advise the Ministry as to the conditions of employment that are likely to be productive of the largest output. In making recommendations they are actuated by what is immediately practicable rather than by what would be desirable under normal conditions."

The work of this Committee and the records they collected provided starting-points for many of the efforts the Ministry undertook for safeguarding the welfare of workers and for improving conditions of industry, and it is fair to say that no proposals were issued or acted upon that did not rest upon a sufficient basis of well-ascertained fact.

HOURS OF LABOUR

The first group of questions upon which the Committee concentrated were hours of labour, and their relation to output. In addition to their own visitations and to the records from our own officers and from employers, they appointed Dr. W. H. Vernon, Fellow of Magdalen College, Oxford, with a number of others suggested by the Medical Research Committee, to make systematic

enquiries into industrial fatigue and its relation to hours of labour, working conditions, and output. The results of these enquiries were subsequently issued as parliamentary papers.¹

Neither employers nor workpeople made any difficulty in helping this enquiry, for care was taken that the work should be set about in such a way as to enlist their co-operation. The pressure for munitions output was responsible for much of the overtime that was then being worked, and in many cases managers and men had been working exhausting hours for long times past. One of the best of the works managers told us that he himself had worked 361 days during the previous twelve months, and a skilled tool-setter in the same firm had only had eight days' holiday since the war began in August, 1914. Nevertheless, in those early days, owing perhaps to the patriotic inspiration of the time, the Committee did not find that the long hours worked up to that time had caused the amount of breakdown anticipated, although there was very definite evidence that they were beginning to make themselves felt amongst the older workers, managers and foremen.

A striking illustration of the imperceptible and dragging effect of prolonged overtime was afforded in one of the works where a shop had been duplicated and where, except that the new shop was better planned and ventilated, it was substantially identical both as to equipment and otherwise with the old one. After a short time it was found that the fresh workers in the new shop were giving an output of 13,000 stock articles per week, whilst in the older shop where the people had been working under great strain for nearly twelve months the output was less than half that number.

The first step taken on the first report of the Committee was to issue an order providing a compulsory rest-day every week except for special purposes and in exceptional cases. Later on this was followed by separate orders dealing with the hours of employment of women, young persons and of men. A section of the Office under Sir Douglas Newton, M.P., in Wolfe's Department dealt continuously with hours of labour questions and made systematic enquiries into complaints and into the effect of the policy adopted. There was an emphatic body of testimony, from employers whose output statistics were well kept, of the unwisdom of excessive overtime, and in many cases even of overtime at all, although some firms, judging by their experience up to the autumn of 1915, justified the continuance of arrangements whereby men worked a fifteen-hour day, from 6 a.m. to 9 p.m. There were not many of them, however, who maintained this opinion for long.

¹ (1) Memorandum No. 12, C.D. 8344, 1916, price 1½d.

(2) Industrial efficiency and fatigue, C.D. 8511, 1917, price 1s. 3d.

There were some employers who had never given any thought at all as to what was the most useful working time in regard to the efficiency of their workers and output ; they did not seem to realise that working people were human beings like themselves, subject to becoming tired and exhausted, and they often received our instructions on the limitation of hours with a sort of superior contempt. It is charitable, I suppose, to put this kind of attitude down to ignorance rather than to inhumanity. The frame of mind of people who have no appreciation of the usefulness of sensible enquiries into these matters, or of the necessity for a humane outlook upon them, has done more to prejudice labour than all other considerations put together. The vast majority of employers were glad to do the right thing if we could find out what the right thing was, but the existence in any district of one or two stupid people of the character described provided pabulum for agitation and ground for unrest that went far to undo the good which might arise from the better conditions enlightened employers were glad to promote.

Bad conditions of work were, geographically, just as patchy as were the troubles over dilution and disputes generally. It may be taken as true that, almost without exception, although the reports came in from quite independent people and from different points of view, those districts where excessive hours were being worked, where there was resistance to the institution of welfare arrangements, where unrest was endemic and where a poor output was being obtained, were those very districts in which Lever and Mann's reports showed that working costs were high. It did not matter much whether the report came from West's Department, or from Quinan for Explosives, or from the Health of Munitions Workers, or from Stephenson Kent, or from Wolfe, the conclusion was obvious :—these things went together.

As the result of our investigations an order was issued providing that the average weekly hours for men should not exceed sixty-five, including overtime, and this allowance made substantial concession to tradition beyond what Vernon's reports showed to be the most advantageous working hours, although at that time weekly totals of seventy to eighty hours were very frequent indeed.

The Sunday rest-day order was welcomed by everybody, and had most useful results, but in the case of women it was soon shown beyond any practical question that a working week of from more than forty-eight to fifty-two hours depressed output and physical conditions. The regulation of the hours of women to conform with this ideal was very difficult, because the most advantageous way of employing women on this basis was to have three shifts of eight

hours, and not to exceed twelve shifts per fortnight. It was difficult in many cases to fit these arrangements in where two shifts per day were ordinarily worked by the men in the shops, and a great variety of devices was adopted. The first approach to this end was to secure that the maximum working hours for women and young people should not exceed sixty, and it affords an indication of the distance we had to go before the week not exceeding fifty-two hours could be reached. It often happened that the workers themselves were reluctant, from patriotic as well as from wages reasons, to reduce the hours below sixty; but there was no escaping the practical conclusion that not only was the hourly rate of output better, but the total weekly output was better in the case of the average women workers when their working time did not regularly exceed fifty-two hours per week.

Our own factory at Woolwich was soon the subject of a special enquiry, and the report reflected unfavourably on it, but it had to be borne in mind that the difficulties there were altogether abnormal because in those days Woolwich was the final collecting centre for all sorts of supplies, and was the headquarters both for the manufacture and for the distribution of samples, gauges, and other materials that were being clamoured for all over the country.

CANTEENS

The second report of Newman's Committee dealt with feeding arrangements and with the provision of canteens for munition workers. In the previous month of June, 1915, the Liquor Traffic Control Board had set about the creation of canteens for providing light refreshment and to that end was giving assistance to the Y.M.C.A. and other voluntary organisations, so that there was in existence a Canteens Committee of the Control Board, and Newman happened to be Chairman of it. We therefore used this organisation.

The necessity of special arrangements for the provision of meals was made more urgent by the great influx of new workers and because many of them had to obtain makeshift lodgings and to come long distances to the works. In October, 1915, therefore, the Ministry accepted responsibility for the provision of canteens in national factories and for encouraging their provision in controlled establishments. The principle was that these canteens should be self-supporting, and that they should provide good and cheap meals for the workers. Many of the canteens were not only self-supporting but left substantial balances which were devoted either to reductions in food prices or to aiding workers' clubs and to kindred purposes.

From the beginning they provided a striking illustration of how the public was being exploited by various providers, for at nearly all these canteens excellent meals could be obtained for a few pence. The Maharajah of Scinde, in October, 1915, placed £6,000 at the Minister's disposal to use for the benefit of munition workers, and ultimately an arrangement was made whereby this money was used to help various voluntary bodies and the co-operative establishment of canteens inside works. The Canteens Committee of the Control Board worked with this definition of purpose: to "increase the efficiency of munition workers by securing the provision of suitable and sufficient food, and to diminish excessive drinking by counter-attractions." Most of the canteens were provided by the employers themselves in consequence of an arrangement with the Treasury by which employers were entitled to treat the capital expenditure incurred as a trade expense. Around these canteens there grew up all manner of clubs and associations in the different works, and they became exceedingly popular. By the middle of 1916 half a million munition workers were able to obtain cheap meals under decent conditions, with a comfortable room to sit in and without having to go for long distances outside, often in inclement weather. From this time onwards they became an established feature of all the industries engaged in the production of war material.

Apart entirely from the special circumstances of the time, one of the most important reasons for the rapid development of canteens for workers and what came with them, was the allowance of the Inland Revenue that the cost of canteen construction should be "a trade expense." It ought to be allowed generally, like other expenditure of a similar character, for there is no doubt that these things are useful in promoting the efficiency and contentment of workers, and many firms are glad to devote money to their provision if it is treated for taxation purposes as a trade expense. We had a hard fight to obtain this concession because the Treasury had hitherto taken far too narrow a view of matters of this kind. The utterly insufficient allowance for machinery depreciation is a kindred case—provided the depreciation amount is placed in an appropriate account and not distributed in profits. It would have been good for the country during the war if depreciation allowances had been more generous and more far-sighted. Insufficient allowances led to the continued use of machinery which ought long ago to have been scrapped, and would have been scrapped had the policy of the Treasury been different. Allowances for machinery depreciation and replacement bring their return later on in increased output and in industrial efficiency, just as the allowances towards

canteen provision brought returns in workers' health, efficiency and contentment.

WELFARE WORK

Another considerable undertaking of the Ministry sprang to a great extent out of the third Report of the Health of Munition Workers Committee on the need for welfare organisation. A good many employers had previously instituted sensible and practical welfare arrangements in their own works, but amongst the mass they were exceptional. The influx of large numbers of new workers of the most diverse classes, many of them quite inexperienced in industry, raised a group of questions affecting not only the provisions of meals and hours of work, but sickness, fatigue, shop-ventilation, lodgings, and physical efficiency generally, as well as many social questions not hitherto prominent.

Towards the end of 1915, therefore, an arrangement was made whereby a group of people under the general direction of Mr. Seebohm Rowntree were appointed by the Ministry to become responsible for what was known as Welfare work. The Report which led to the initiation of this enterprise was founded on the evidence of experienced employers.

It is a commonplace to say that "the effect upon the health and energy of the women and girls which result from clean, bright, airy workrooms, well warmed in winter, can hardly be exaggerated," but the general recognition of it was a new feature in industry.

With Rowntree and his colleagues, even more than with Newman, it was necessary to set to work sensibly and gradually, and to carry employers with them. Many needed no persuasion and were fully alive to the good sense from a business point of view of taking proper thought for securing the health and comfort of their employees; for the observations of those who were investigating industrial fatigue had made it increasingly clear that it was "good business" to attend to these things.

As the result of the experience first gained it was decided to train a number of welfare superintendents, and before the war was over there were courses of instruction in practical welfare work in many of our universities and colleges. There was no appointment in which the personal possession of tact and good sense was of more importance, and many employers came to insist upon the welfare superintendents being persons of good education. Successful welfare work does not depend upon extensive equipment or vast organisation, for the smallest factory and the humblest organisation, if worked in the right spirit, showed good results.

The duties of the welfare supervisors were as various as the

circumstances of the different works. In many factories they were used by the management to keep in touch with new labour and to assist in the discovery of promising operatives. They kept schedules of lodgings and hostels and generally helped the new workers to obtain accommodation; they made arrangements with the tram and bus companies for transport, supervised the canteen work, investigated records of lost time and sickness, promoted trade clubs, educational work, classes, and so forth. In most of the works they came to have responsibility for arranging training in first-aid work, for supervising cloak rooms, sanitary accommodation and washing arrangements, and sometimes for such matters as the patterns of overalls and clothing, and other homely tasks of that kind—down even to discovering the best kind of soap for removing grease and dyes from the workers' hands.

In the explosive and chemical factories welfare work underwent the greatest development, and in most of them there came to be special nurses and matrons, or even established medical officers. As a final example of their diverse duties I recall that the aid of the Welfare Supervisor was enlisted in combating a notion that gained currency during 1916, as the following diary note shows—

November 16.

"In the afternoon I had seriously to admonish a deputation from the Federation of Women Workers whose agents have been holding meetings at Coventry. One of their speakers appears to have been giving the girls a lurid and comprehensive account of the dangers of T.N.T., etc., *inter alia* saying that all their inside organs would turn yellow, that they would not be able to have children, and so on. I said we should certainly use the Defence of the Realm Act against this sort of mischievous nonsense unless it was stopped at once. They professed the utmost surprise and penitence, and promised to help us."

EMPLOYMENT OF BOYS

In April, 1916, the Rev. Robert Hyde, the well-known head of the Maurice Hostel, in Shoreditch, began to devote his time exclusively to promoting welfare arrangements for boys employed in munition factories, to the establishment of clubs and classes for them and of other arrangements for promoting their self-respect and keenness. Somewhat to my surprise this branch of the work was exceedingly popular with employers, and it certainly was with the boys themselves. No doubt it was mainly due to the sensible way that Hyde handled it, but I see that my notes contain long columns of the names of firms who had established welfare arrangements for the boys and young workers on their own lines, and who were heartily supporting Hyde's work.

The way the welfare work was accepted in industry was significant of the spirit of the time, for it was then manifested, if never before, that we were "members one of another." Many business men realised for the first time that it was worth while to give thought, in practical homely detail, to the physical and working conditions of the people employed in their workshops. It was our hope that the standards and traditions then established would continue, and I believe that, notwithstanding the trade depression, much of the work done then is being retained as a permanent feature in industry.

HOUSING

Another undertaking that arose out of this branch of our work was the provision of some emergency form of housing accommodation. In many places, like Woolwich and Coventry, the housing question had been acute before, but the pressure was now greatly intensified. The exorbitant rents people began to charge in some places for the most wretched accommodation, even when two or three workers had to share one room, was the beginning of the discontent that led to the first Rent Restriction Act. Sir Robert Carlisle was placed in charge, and although he managed to produce great improvements in many places and to secure much improvised accommodation, he had to report that nothing short of rapidly improvised new buildings would meet the necessities of the case in many places. By the aid of the Local Government Board, and of the reports of our own people, lists were made out of the places where the need was most urgent, and in March, 1916, Sir Henry Holloway was brought in to take charge of the new construction to be undertaken on the Ministry's responsibility. Before this time there had been a scarcity of building labour, and the provision of mobile squads of building labour had become one of Herbert Morgan's duties. They were needed for the new factories, sheds, stores, huts and encampments required by the War Office, the Admiralty and ourselves. This early shortage of building labour revealed how the depression in the building trade and the poor conditions of employment for some years before the war had led to a gradual depletion of the ranks of building trade operatives apart entirely from the extensive Army recruitments that had taken place from it. Under Holloway's direction, accommodation was provided for great numbers of workers. The buildings were mostly of a temporary character, but a small addition, of about 50,000, was made to the nation's supply of permanent houses. It was a trifling contribution so far as houses went, but it is interesting to notice that under Holloway's direction—with the powers of the Ministry behind him—there were none of the unconscionable costs

incurred such as characterised the days of 1919 and 1920 when the nation had the benefit of unrestricted competition.

WAGES

Wages are inseparable from welfare, although those concerned in the administration of the Health and Welfare Sections at the Ministry were not called upon to deal with them. It was a duty that devolved upon those whose business it was to specialise upon this most intricate and bewildering of all labour problems. Wages questions have a jargon and vocabulary of their own. Even in a single trade, like engineering, with hundreds of different types of workers, all manner of scales, allowances and rates prevailed. They are founded, it is true, upon some general agreement between the employers and trade-union representatives, but they are applied in an infinite variety of ways in different districts and workshops, and with a terminology only comprehensible to the expert.

So far as women's wages were concerned, we had nearly a clean slate to write upon, if the pre-war standards can be described as clean. There were standards, it is true, set up in a few sweated trades, but nobody suggested that we should be guided by them. The average wage of adult women employed full-time before the war appears to have been about 12s. per week. How grown-up women maintained and clothed themselves in decency on 12s. a week it is difficult to understand, except that their wages formed a small contribution to the household budget.

The introduction of dilution, however, made it essential that there should be power to fix the wages of the people brought in. It was implied in the Treasury Agreement. The first proposals in October, 1915, were recommendations only, and for the most part they were loyally observed as binding, but it became necessary in the Munitions of War Act, 1916, to take *powers* to fix wages. The first thing to determine was, how were the women to be paid who were introduced to do men's work or parts of it. There were no precedents in this matter at all, and the first proposals of October, 1915, were drawn up with the assistance of Henderson's Committee and were frankly tentative. On paper, some things were clear enough; for example, where a woman was employed on a skilled man's work and did the whole of his work she should be paid the same rate. But in a large number of cases, especially at the beginning, the woman was only doing a part of the skilled man's work, and it was this that gave rise to a good deal of trouble when we were called upon to interpret the terms of the Circular. Our decision was—and on paper it was a common-sense decision enough—that where a woman was introduced to perform a part only of

the work previously performed by a skilled man she was not entitled to receive the full district rate customarily payable to the skilled man, inasmuch as she was not performing in its entirety the work customarily done by him. If, however, in the opinion of the employer and the representative of the men in the shop the nature of the work and the degree of efficiency acquired by the women were such as to justify the application of the full district rate, then it could be paid. But there were many thousands of women employed by the hour in doing parts only of men's work. There were additional complexities where some women were employed on munitions work in a factory which at the same time was employing a number of women on other work, and all sorts of distinctions as to types of workers and grades of allowances immediately cropped up. At first it was provided that where a woman was doing any kind of men's work she should not be paid less than £1 a week. Directions also became necessary for the wages of women employed on many tasks that were new but which might perhaps be described as women's work, for the wages of girls on men's work, for overtime allowances, Sunday work, night shift, and many more. In effect, the result was that the minimum rate for a woman working by the time for a week of forty-eight hours on women's work came to be 22s., and on work which could be described as men's work, 24s., the hours beyond forty-eight being paid as overtime.

The high wages that were earned by women piece-workers were the result of the maintenance of the Treasury Agreement, and they often made more difficult the position of the skilled men who had been taken off piece-work and put on to supervision and instruction at the time-rates prevailing in the district. The great majority of women's earnings, however, even where they were employed by time, was substantially more than the minimum figures above quoted, for there were allowances for output, extra time, and so on.

The Circulars prescribing minimum wages for women were frankly looked upon as a sort of charter of working women's wages rights. They created a precedent in British industry, and although everyone knew that the extras which led to the high wages of the war period were not likely to continue, these orders did in fact embody for the first time the principle (astonishing as it may be) that a grown woman employed all her time should at least receive sufficient wages to keep body and soul together.

The great bulk of employers, and certainly the representatives of their organisations, heartily supported the principles embodied in these Circulars, for they were glad to have some machinery to secure that those who exploited the abundant mass of female labour

and paid wretched rates of wages should be brought in some measure up to the standard of decent employers.

We had some very remarkable manifestations as to the conceptions as to what working women ought to be paid. One of the most notorious in my notes and in my recollection is that of a Member of Parliament who, I am sorry to say, called himself a Liberal, and who had a factory employing a considerable number of girls and women. When, at first, we had the temerity to fix the very modest figure of a £1 week as the minimum, he pursued me with vehement and persistent heckling in the lobby and outside. This outrageous order of ours, he contended, was going to ruin industry and to make competition impossible. I took the trouble to find out what the average wages of the women were in his factory : fourteen shillings a week was the maximum, and substantially less than that was the average. A considerable amount of war-work had been coming his way and this Circular was to be applied to his establishment. Very naturally all the girls and women wanted to get on to war-work and the competition for female labour prevailing at that time prevented the maintenance of the lower standard on private work. Our differences culminated in an acrimonious discussion in the lobby, in which I enlisted the aid of two or three members of the Conservative Party who happened to be passing to hear the case stated and pass their judgment upon it. They, of course, immediately wanted to know from my heckler what his average wages were, and wrung it out of him after much difficulty. There was no hesitation in their judgment, for they knew well enough that a woman could not maintain herself on 12s. a week. This man, I suppose, meant to be humane. He was a lifelong Liberal, but he had got it into his bones that 12s. or 14s. a week were good wages for a working woman, and that somehow or other competitive industry would crack if more had to be paid. I should surmise that his cost-accounting methods, if he had any at all, were of a somewhat antiquated character, and that, like so many other people whose accounts we probed into and whose one idea was to reduce costs by cutting down wages, it would have paid him handsomely to have employed a good cost accountant at a good fee to report in truthful fullness on all the ingredients of his costs. It might have revealed to him, for the first time, how many other elements entered into it that he had not sought to control or to reduce, and have revealed the sloppy methods which our experts reported were prevalent in his works.

The leaders of the deputations of the women's federations were, on the whole, the most pertinacious and ingenious of the many that waited upon us. After Lloyd George became Secretary for War in

the middle of 1916, and Montagu became Minister of Munitions, the late the Hon. Neil Primrose replaced Lord Lee as one of the Under-Secretaries, and one of his duties was to help to receive labour deputations. He was a lovable and loyal colleague and only left us afterwards, to give his life in Palestine, because he was of military age. He used to rejoice in the labour deputations because, as he told me, they gave him an insight into a side of the worker's life which he had never previously obtained. One of the most delightful entries in my diary of our doings with one another relates to an afternoon in November, 1916, when he had been struggling for some hours with a deputation of women from Barrow. At that time I had taken up my quarters in Armament Buildings, and about five o'clock he sent an urgent message across asking me to come over and take a hand. The ingenious and pertinacious Miss Sloan was employed on the agreeable pastime of starting a new topic or grievance every five minutes until there seemed to be so many before the meeting that the perplexity and distress of some members of the deputation became so acute that some of them had been reduced to tears. Primrose's message was to this effect: "I have some ladies in tears in my room, old chap; come along, please, and help me to comfort them, also to clear my room, for there are crowds of other things waiting."

We had a little private conversation with Miss Sloan, and it was ultimately agreed that it would be a good idea to have tea, and we provided a goodly supply of tea and cakes. In the conversation in corners during the intervals of tea Primrose and I managed to induce the leaders to abandon the pursuit of the immaterial game that had been let loose and to keep to the course designed. As often happens on such occasions, an adjournment, fresh air, and a cup of tea have a very clarifying effect upon temper and upon issues. Primrose thereafter made a delightful five-minute speech on agreed lines; it settled the issue so that everybody went home happy, and no one was happier than Primrose, who did leap-frog over the chairs because his room was clear at last.

The efforts of the Ministry with which this chapter has attempted to deal were the outcome of our determination to make at least some use of a unique opportunity. This survey of them is admittedly incomplete. Their chief importance is that they marked the recognition of the fact that the producer is not simply a person employed for so many hours and paid such a wage, but a fellow human being, with physical needs and weaknesses inseparable from his ability to work well. It was attention to these things that led to the institution of all sorts of arrangements which some used to

describe as "frills." The pity of it is that in the post-war reaction so many of them have become lost. Nevertheless, I believe that history will show that, although many good and far-sighted employers had shown the way before, these efforts of ours introduced into the general body of industry a point of view and a scheme of effort that will come to mark a wholesome and important departure in the traditions of British industry.

CHAPTER XVI

MUNITIONS, MEN AND EVENTS DURING 1916

Premises—Ivor Phillips—Lee—The Artillerymen and Trench Warfare—Diary Extracts—Robertson and Trench Warfare Batteries—Shell Supplies—West's Achievements—Diary Extracts—Geddes—Milman—Minchin—Sothorn Holland—Filling and Inspection—The Results—Ammunition Expenditure in France—Lloyd George at the War Office—Geddes Director of Transport—Bingham for the Ministry—The Aircraft Controversy—June to November—Curzon-Balfour Memoranda—Growing Dissatisfaction—The Ministry charged with Aircraft Supplies—Other Problems—The Advisory Committee—Northcliffe and T.N.T. Poisoning—The War Office and Costs—The Strain of the Work—Fortnightly Staff Meetings—A Typical Day.

BEFORE describing the political events of the year 1916 which ended with Asquith's resignation and the formation of the second Coalition Government, under Lloyd George, it may be interesting, and it will throw some light upon what was happening, if we gather together some general references to munitions and other developments during that time.

The premises first occupied by the Ministry were confined to No. 6 Whitehall Gardens, and the adjacent house, but one after another the houses in that interesting old terrace were absorbed, and the ground behind became covered with rows of wooden buildings chiefly devoted to the accommodation of the Labour Department. When Girouard and Booth came over from the War Office with their small staff they occupied a building being prepared for the Board of Agriculture in Whitehall Place. This was christened "Armament Buildings," and soon afterwards the contiguous Hotel Metropole was absorbed by departments connected with guns, gun ammunition, steel, materials and finance; but we were accustomed to speak of the whole group of these offices as Armament Buildings.

The Explosives Department was established in Storey's Gate, and continued there. Trench Warfare made its home in the Board of Education, and many of the rooms that in earlier days I used to know as the abode of men dealing with technical and secondary education became filled with others busy on the production of grenades, bombs, trench mortars, helmets and poison gas.

Major-General Ivor Phillips was appointed additional Under-

Secretary to help on Artillery questions, but to our regret he had to leave us in September, 1915, to join the Division of which he had been appointed Commander. He was succeeded in October, 1915, by Sir Arthur Lee (now Lord Lee), who was styled Military Secretary.

There were bound to be some difficulties from time to time amongst the great body of men we had gathered together. Many of them in civil life were heads of important firms—commanders, rather than members of a team—but the amount of difficulty we had in getting all these able men to work in harness together was extraordinarily trivial. The real reason was that they themselves had wide horizons and could appreciate the importance and magnitude of other men's work as well as their own, and were big enough to adjust amongst themselves the numberless personal and other issues that arose as they went along. Every now and then some question of status or of the divisions of responsibilities would arise between them and come to the Minister. Lloyd George used to saddle a good many of such questions on to me—to be settled, if possible, or, failing that, for recommendations to himself. Black was a most skilful peacemaker, but there was surprisingly little even for him to do in this respect. We had as grand and loyal a body of men as could possibly be imagined, and references to internal troubles in my diary notes are noteworthy because they are so exceptional.

TRENCH WARFARE QUESTIONS

The chapter on Trench Warfare has revealed how that department had to fight against established prejudices. The same thing happened in the field of battle and was reflected in the early military organisation for Trench Warfare. For some reason the Artillerymen resented the independent existence of a Trench Warfare organisation, and there were repeated attempts within the Ministry itself to induce us to scatter its sections through the General Supply departments. Du Cane and Lee supported this sometimes, and, as the patron saint of the Trench Warfare Department, I had to fight a good many battles on behalf of Jackson, Roger, and their men. The view I took and successfully maintained was that Trench Warfare was so highly specialised and the different sections of it so closely related to one another that there must be a group of men set apart who had no other solicitude than to deal with this one set of questions. If the different branches of it had been scattered; one, let us say, in Inspection, another in Filling, another in Fuses, another in Guns, and so on, they would have lost their individuality; it would have been nobody's particular interest to view their work as a whole, and, indeed, it would have been almost impossible to

do so. Before the end of the war, under Churchill, some measure of absorption did take place, but it did not matter much then as the supplies of mortars, grenades, bombs, helmets and their other munitions had become a thoroughly smooth-running and almost automatic business. I can offer no opinion as to the effect of what took place upon the study of Trench Warfare developments, but it is quite certain that in the early days we could never have met the demands with the readiness and unified enthusiasm that was necessary unless the department had had an independent existence.

These comments explain some of the following diary references.

January 6.

"The trials of Stokes guns were wonderfully successful and I did not fail to point out to L. G. that they reflected enormous credit on Jackson. . . ."

January 17.

"The hostile movement against Trench Warfare is subdued for the present. Their deliveries of mortars are remarkable and are up-to-date, and they appear to have got over the difficulties of the Stokes ammunition and the 2" mortars. The Stokes shell and Jackson's modification of the fuse have come triumphantly out of the trials. . . ."

January 19.

"In the afternoon I went to Shoeburyness and we had a full-blown trial of all the different mortars. The Stokes was an absolute triumph. Du Cane, who had previously seemed prejudiced against it, came away enthusiastic. There was no comparison between its efficiency and the other mortars of the lighter kind. We got over twenty rounds of the Stokes, every one of which exploded splendidly in much less time than we got off five from any other. The 2" also came out well, but the Vickers and the 3.7" made a poor show, and Du Cane heartily agreed that they might be dispensed with. I hope that we shall manage to bring this about and so secure a reduction in the number of types."

In consequence of the satisfactory trials referred to in the note of January 19, the General Staff decided, shortly afterwards, to cease ordering the 3.7" and the 4" trench mortars and asked us to concentrate upon the Stokes and the 2". It constituted a further tribute to the foresight of Jackson and some of his colleagues who had been urging this course for some time. The trouble was that in this instance, as in some others, we had had to commit ourselves to considerable orders of other types in consequence of the programmes previously formulated, and it was a costly and troublesome business to have to countermand supplies, when, after the usual preliminary period of waiting, contractors had just begun to make good deliveries. The language of some of the contractors on occasions of this kind was often more forcible than complimentary to

the great men of the Staff: but these changes were inseparable from an intelligent use of war experience.

The extensive use of the improved types of trench mortars presented one feature similar to that of the more complicated tank; it was that the men who had had to struggle through the trials of experiment and manufacture were in advance of the Staff as to the right way of making use of them. We had had a good many complaints as to the quality of the units set apart at the Front for using these weapons, and the following note of January 17, 1916, is explained by the fact that I invited Lloyd George to raise the question now that we had become assured of generous supplies—

" January 17.

" . . . I have raised the question of the provision by the Army of sufficient trained men to deal with the large supplies of trench mortars, etc. It seems that two or three thousand officers and 18,000 men or thereabouts are required. It was agreed that I should put up a memo. for L. G. which he could raise at the War Council. Du Cane checked and corrected the estimates of figures for the batteries to be available, and L. G. piloted it through the War Council on Thursday. . . ."

According to the accounts we had, Kitchener was not very favourable at first to the creation of a separate Trench Warfare personnel, but Robertson took it up with sympathy. Nevertheless, events moved very slowly for some time, and I see that in May, when we must have been fuming more than usual over the delays in organising Trench Mortar Batteries, I wrote the following—

" Things are not moving fast in connection with the organisation of Trench Warfare personnel in the field. It was not our particular business, but after having sweated blood to get these things provided we mean to do our best to see they are properly used."

At the risk of giving a somewhat long diary quotation, it may be worth while giving a note of May 8 of an interview with General Robertson on this subject—

" May 8.

" I saw Robertson, the Chief of the Staff, this morning, as was arranged last week. The subject of the interview was the wretched organisation which, up to the present, seems to have characterised the Trench Mortar Batteries. As I have noted before (January 17), I sent in a memo. to L. G. for the War Committee, which he brought forward, and he obtained an order that a thorough organisation should be created for training a large number of men—say 2,000 officers and 20,000 men—to use the Trench Mortar Batteries we were turning out. About ten days ago the C.O. of the Trench Mortar School of the . . . Army came privately to see me and confirmed all the reports that we have had from all sorts of quarters. It appears that the men for the light batteries (Stokes) are obtained by Battalion Commanding

Officers sending groups of privates, non-coms. and subalterns to undergo the training. The result is you get men from all sorts of units cheek by jowl with one another, and, human nature being what it is, Commanding Officers do not send their best men. . . . The same applies to the men in training for the medium batteries (2"), who are provided from the artillery units. There is apparently no arrangement for its being made into a proper corps with its own special training and organisation. No mobilisation table has yet been issued for the Stokes batteries and I believe not for the 2". The result is that there is no supply of spare parts, although we have them in abundance in this country. Moreover, there is no transport provided, no camp equipment, cooking pots, etc., so that the men are dependent upon what they can beg, borrow or steal from neighbouring units. The whole thing, in fact, is a muddle. I discussed this with L. G. last week, and we decided that the best thing for me to do was to see Robertson and tell him all about it, and I did so this morning. He is canny, but I got the impression that some of it was news to him, and he promised me he would have the matter put in hand at once and proper organisation for a corps arranged for. The experience already gained shows that good men, well trained, will get 75 per cent. more out of the Stokes batteries than men who are merely muddling about with it. I sincerely hope that, although it is very late in the day, we will get the matter taken up actively. Robertson is no great worshipping of red tape, and I think he intends to be vigorous about it. . . ."

I cannot say that I kept in close touch with the developments which Robertson secured, but it was not long before the organisation of the Trench Mortar Batteries in France was as efficient as any other, and the officers in charge were some of the keenest and most enthusiastic men we had anything to do with.

GUN AMMUNITION PROGRAMME

The one popular test of our success at the Ministry of Munitions was, "Are the men getting enough shells?" and the internal difficulties experienced before we obtained a satisfactory output of completed gun ammunition should form the subject of a few extracts.

The work evoked the united efforts of a great number of men, and resulted in what was perhaps the most brilliant and striking of all the achievements of the Ministry. The sequence of events from the early days in which we counted the completion of a single round as a precious thing and when our output was barely 150,000 a week, to the time when all the store-houses in France were full and the supplies were limited only by the means of transport and storage, witnessed more uprootings of men and things from one end of the country to the other, and more labours and heart-searchings as well as final triumphs of production than any other effort.



SIR GLYNN WISE, K.C.B.



MR. C. H. STEVENS



MR. J. B. MACLEAN.

Somehow or other one almost got into the habit of overlooking the Explosives Supply Department. They were always so up-to-the-mark. Otherwise there were three outstanding departments in the work of producing completed ammunition: first, the manufacture of the different parts; second, the filling of them with appropriate explosives; and, third, the assembly, inspection and approval of the millions of separate pieces.

As a manufacturing performance, Glyn West's achievement stands out as gigantic. He was responsible for the production of every part that went to make a complete round of ammunition except the explosive—shell cases, cartridge cases, fuses, primers, gaines and the rest. It meant the manufacture, delivery and correct gauging of many millions of parts every week. Llewelyn and Hunter for materials and steel on the one side, and Herbert for machines on the other, were of course intimate partners in West's efforts, as were the Boards of Management and the whole of the elaborate organisation which was then functioning under Stevenson; but West and his splendid band of men, from the early spring of 1916—when their arrangements had become well established—to the end of the war, achieved a triumph of expert and organised production that must always, I think, occupy one of the highest places in the records of British engineering.¹

FILLING AND INSPECTION

The arrangements for filling and for inspection was less obvious and striking, but they required an organisation for transport, handling, assembly and despatch that compelled us to devote to them an increasing number of some of the ablest men at our command.

Two diary quotations may introduce a short account of how the difficulties were faced and overcome—

January 17.

"Tuesday last week we had a stormy and difficult meeting with the heads of the office. There is no doubt that there is a serious lack of equality between the manufacture and delivery of shells and their filling. Geddes has been taken from his other jobs and made responsible for filling. There is no denying that he has to clean up rather a bad mess. We ought to obtain complete co-operation between West (manufacture), Minchin (inspection), and Geddes (filling). . . ."

¹ As illustrating what was involved, a summary of the parts and processes involved in the manufacture of a complete round of 18-pounder ammunition is given in the Appendix, No. 9.

February 9.

"L. G. sent across a very drastic Minute to Lee and Black, wanting to know why Armament Buildings were so far behind their promises. They naturally were sore about it, on the ground that they have been no party to the promises. . . . The ultimate result, however, will be to galvanise the filling arrangements."

The extract of January 17 shows that already Geddes had been placed in charge of the arrangements for filling, shells, fuses and other parts, and that General Minchin had been appointed to organise the arrangements for inspection so as to keep them abreast of the deliveries of manufactured parts. Unfortunately there had been a good deal of muddle, and uninspected parts were accumulating in vast numbers. Minchin had to leave us shortly afterwards to take over a similar duty in America, and Lloyd George laid hold of two of the best men in the Explosives Department to take charge of it. Sir Sothern Holland was asked to come, but nothing would persuade him to do so without his colleague, Sir Ross Skinner, for these two men were as much like David and Jonathan in their work together as any two men I have ever known. Both Geddes and Sothern Holland had a tremendous task. West was pouring in supplies whilst filling factories, inspection stores, training of workpeople and all the rest of it, had to be pushed forward with tremendous energy, but in two months the chief difficulties had been overcome, and the accompanying notes of May 10 and 30, 1916, show how that, after a year of struggle, we were masters of the situation at last so far as the supply of ammunition was concerned—

May 10.

"Munitions output. Great progress is now being made. Our munition output is nearly as good as the French in rifles, machine-guns and small-arm ammunition; in guns we are much better. The filled-shell output, thanks to the strong team that is now engaged, is jumping up at the rate of 50,000 a week. In the battle of Loos last year our people expended 600,000 rounds which they had obtained as the result of three months' hard savings. Last week alone we sent out 690,000 rounds. They have more than five millions in stock in France, and their present depots are full. The cry is now for more storage accommodation on the other side, and until this is provided we shall have to mass supplies in this country."

May 30.

"Shell-filling progress continues. The following table is interesting as showing the effect of holidays upon output, and the rate at which output has been growing in consequence of the vastly improved arrangements of filling, under Geddes, and inspection, under Sothern Holland—

					Complete Rounds delivered.	
" April 15	.	.	.	.	501,000	
" 22	.	.	.	.	374,000	} Easter
" 29	.	.	.	.	374,000	
May 6	.	.	.	.	645,000	
" 13	.	.	.	.	754,000	
" 20	.	.	.	.	816,000	

" This last week it will be well over 900,000, and we hope to reach the million in a fortnight. The holiday figures show clearly enough why we don't want any repetition of the Easter break, if we can avoid it before the end of July. If we could only show these figures to the labour deputations when we discuss holidays, it would make understandings a good deal easier."

What a struggle it had been ! Bewildering, complex, desperate ! So utterly different from what were the generally accepted notions of what was involved. Far-sighted shipping and purchase arrangements were involved with elaborate transport schemes, a host of warehouses, stores and assembly stations, and an entire upheaval of all the established practices of the engineering trades. Nearly every type of industry in the country, from the man who dug limestone to the famous chemist in his laboratory, had been mobilised in the Service. It was, above all, remarkable for the forethought and scientific organisation which were devoted to it by the splendid men and women in charge. I can remember well the joy with which I dictated a note of July 17, 1916—

" We are now supplying more munitions than the Transport Department of the War Office can handle.

" The main block seems to be in the ports of France which are out-of-date and unable to deal with the huge output of munitions. The shell output is up regularly to a million a week, and Geddes and Sothorn Holland are doing marvels in the matter of 8" and 9.2" shells. . . . When we remember that each 9.2" shell weighs about half a ton, one can realise what it means. The fact, however, is that during the last two weeks the W.O. have received from us more filled shells than the railways in France can cope with. . . ."

We knew that, if necessary, by the end of the year we could make the 1,000,000 into 2,000,000—and with ease as compared with the labours that had been undergone in bringing the figure up to the first million. We were proud of the figures in July, but from that time onwards, with the more plentiful supply of guns, the expenditure of ammunition became much greater still. Nevertheless, supplies kept pace with it. During the five weeks ending May 5, 1917, as much ammunition was expended as during the whole eighteen weeks of the Somme battle, but the supplies at the end were much greater than they were when the Somme offensive opened.

TRANSPORT AND DESIGN

Lloyd George went to the War Office in June, 1916, and he soon "borrowed" Geddes from us to take charge of Transport in France, and Colonel Milman¹ became head of the Filling Department of the Ministry.

As mentioned in a previous chapter, Geddes was not long before he put up huge demands for railway materials supplies. It necessitated the creation of a Railway Transport Supply Department, and Moir was taken from some of his American and other duties to superintend it.

About the time that Geddes left us, General Du Cane ceased to be our Director-General of Munitions Design and left to command a division in France, and the following note of July 17 shows how we used the exchange of Geddes to secure Bingham from the War Office in place of Du Cane—

"Du Cane going. . . . We should like to get hold of Bingham to take his place, and I went to L. G. on Wednesday to try and fix it up. The men at the War Office want to stick to Bingham and L. G. does not like to cross them in this. He said we ought to have Von Donop. . . . I congratulated him on discovering Von Donop's suitability for the Ministry of Munitions after he had left that department to become Minister of War. I said it was not quite as original as most of his suggestions. He was in good humour over the whole business. I think he will let us have Bingham with a little pressure and does not object himself, as we are going to let him have Geddes for Transport."

The appointment of Bingham was satisfactorily arranged and he was more responsible than anyone else for promoting that sensible and harmonious co-operation between the men responsible for design and those for manufacture that characterised the work of the Ministry from this time onwards. We had suffered much from the lack of it.

THE AIRCRAFT CONTROVERSY

About the beginning of May, 1916, the Cabinet appointed an Aircraft Committee, of which Curzon was the chairman, and it was high time that action of that kind was taken, for insufficient provision and multiplicity of type were, even then, commonplace talk.

It was at first suggested that Lee should be taken from us to become Curzon's lieutenant, but he had no desire to leave the Ministry in the full tide of its activity, and the proposal fell through.

Curzon worked at the Air Committee with the same vigour

¹ Colonel L. C. P. Milman, R.A.

and assiduity that he works on everything else, but he was in a very difficult position so far as obtaining supply was concerned. Some departments of the War Office and the Aircraft Department of the Admiralty were in competition with him, apart from the hold the Ministry of Munitions had established like a gigantic octopus over the whole engineering trade of the country. We were only just emerging from the filling difficulties and had so many other tasks on hand that we were entirely free from any desire to do aircraft supply work, but the Air Board was so crippled by the lack of a producing organisation that there was a consensus of opinion in our own office that the only effective way of getting a big output was to link it on to our existing Petrol Engine and other departments, and Roger and Stevenson on more than one occasion produced considered memoranda in support of this view.

The following extracts from June, 1916, indicate the position at that date—

June 12.

" Aircraft. I saw Curzon on Wednesday, 7th instant, on the question of the overlapping of the Ministry of Munitions and the supplies for aircraft purposes. The result of it is that there is to be a joint committee this week on the subject."

June 15.

" . . . Later on in the day we had an excellent meeting with the Air Board at our place, and, I think, on the whole, they were very gratified at our willingness to help without any desire to grab. I am anxious that they should make full use of Stevenson's Local Boards. Now that we have got so many men off 18-pounder shells and the Air people are in want of small firms that can make small engine parts, there are these facilities to their hand. It was agreed, after the meeting, that they and Stevenson should see what could be arranged on these lines."

The Air Committee, however, was in an impossible position unless there was to be a vast and unnecessary duplication of staff and agencies, and within a few weeks we decided to circulate a memorandum setting out our advice on the way to obtain abundant supplies. Happily, we preserved the friendliest and most helpful relations with the Air Committee ; but scarcely the same could be said of the Admiralty—between whom and the Air Board a vigorous controversy was carried on. The memoranda of Curzon and Balfour provided, I think, the most elegant and delightful reading of any series of Cabinet papers that I have any knowledge of. It was like the next instalment of a novel to wait for Balfour's reply, or Curzon's rejoinder. It would have been entertaining enough did we not know all the time that things were really getting no

"forrader " and that a lot of aeroplanes would take a long time to make.

This explains the following note—

July 24.

" . . . Montagu is keen, I am glad to say, on taking aircraft construction into our hands, as it clearly ought to be ; for, as things stand, there is hopeless overlapping between aircraft requirements, the War Office, the Admiralty and ourselves. . . . I have asked Roger and Stevenson to get up a memo. setting out the case and, as soon as convenient, Montagu will bring it up before the War Council."

August 4.

" Montagu this morning dressed up the memo. and had a good deal to add to it. . . . It definitely proposed that we should take over the whole of the aeroplane supplies. I understand there will be some talk to-morrow at the War Council on the subject."

August 8.

" On Tuesday, August 8, we had a conference at the War Office in response to our suggestion that we should be made responsible for the supply of aeroplanes and their equipment. . . . Curzon was sticky at first, but I think in the end he recognised that this was the way to do the job. The struggle of course will be over the Admiralty, because if we take one part of the supplies we ought to take them all."

We did our best to obtain decisions that would make large-scale aircraft production possible, and Montagu was unusually combative about it ; but still talk went on. All manner of memoranda were exchanged, but no decision was arrived at before the end of November. Our men helped the Air Board as willingly as if they had been working under the Ministry's own direction, and many times Curzon paid tribute to them ; but the truth was that, behind these supply questions, air development was held up by lack of decisions on air policy. During the whole course of the war, save for early experiences in Trench Warfare, I felt nothing more maddening than the suspense over air policy and aircraft construction that marked the months from August to November, 1916, and the following notes are the last of a series betraying an increasing exasperation—

November 24.

" There is a growing feeling of disgust both in the House and in the public at the pottering of the Cabinet on big questions. They are still undecided on the Air Board question, although I understand they are to decide on Monday afternoon. The Food Controller is still undetermined. L. G. and McKenna were asking me if I thought Duckham would do. . . . The Man-Power business, of course, still hangs fire, and unless one is greatly mistaken, the Pensions Bill on Monday will be very roughly handled in the House of Commons, as I think it ought to be. As it stands, it means

that there will still be three or four different sets of people dealing with Pensions . . ."

November 27.

"In the afternoon, at 4.30, I had to take the fortnightly Staff Conference, as Montagu was at the War Council which was at last addressing its mind to the subject of the Air Board! . . . To-night I heard that after three hours' deliberation the War Council had still come to no conclusion and had adjourned to hear some experts. I have to attend in the morning with some of our men . . ."

November 28.

"I had a conference this morning with Stanley, Duckham, Stevenson and Roger; we discussed aeroplanes, and afterwards went across to No. 10. . . . They carried the point, showing clearly enough that the only businesslike way to do the work was for one set of people to supply oil engines, etc., whether for tanks, motors, aeroplanes or what not. I saw L. G. for a few minutes in the afternoon and he said to me that his own people had been a good deal against it, but that he himself had said that 'he put his money on those hard-headed men of Addison's at the end of the table,' and I am sure he was right in doing so. We now have to settle how they are to be supplied. . . . We have asked these four men amongst themselves, in the first place, to discuss it."

This decision was taken only a few days before the break-up of the Government, but we got quickly to work upon it, and some account of the progress made will be given when the events of the year 1917 are dealt with.

The reference to Sir Albert Stanley¹ in the last quotation from the diary is explained by the fact that some time before, in consequence of having to become the suppliers of motor transport of all kinds, he had been brought in from the London Underground Railways to have charge of a Department of Motor Transport Production.

The beginnings of some other undertakings, which led to considerable developments in 1917, are indicated in the following extracts—

June 20.

"I had a talk to Duckham and Cadman on the question of oil supplies, which give us a good deal of anxiety—especially lubricating—and I finally asked Cadman, who is an authority on the subject, to let me know his views as to the real position."

July 3.

"A further conference with Cadman on the oil question, and I have asked him and Duckham to submit a practical scheme. Their report is disquieting. We are at the mercy of the Standard Oil and its associated companies in the matter of lubricating oil. The fact is they could hold the country up inside of two months, if they wanted to."

¹ Lord Ashfield.

As a result of these enquiries we supported the Oil Control Scheme that developed in 1917 under Mr. Walter Long's direction.

STORES

Another matter which assumed increasing and, indeed, grave proportions as munitions output became more abounding, was the clearing up of the complicated store accounts of our early days when there had been numberless movements of commodities to and from different works. In the bustle and pressure of the first frantic effort to get munitions out somehow and to bring new people into the industry, a great many things had perforce to be left "to be cleared up afterwards," and the papers relating to them amounted to tons of memoranda. The Finance people, Black, and indeed every responsible departmental Head, had expressed increasing anxiety on this account—

September 14.

"I had a conference with Black, Roger, Milman, West, Ross Skinner, etc., on the much vexed question of munition stores, and we finally came to an arrangement upon it."

The arrangement was that Sir Ross Skinner, whom Sothorn Holland had brought across from Explosives to help in Inspection, was to devote himself to the consideration of the creation of a special section to deal with stores and endeavour to bring order out of the chaos and to establish an improved system.

THE ADVISORY COUNCIL

Montagu took a lively interest in this stores subject, and it was one of those which contributed to his setting up a strong Advisory Committee of some picked men who devoted themselves to considering and advising us as to how to handle not only this subject but other new duties, such as the provision of transport, aeroplanes and agricultural machinery.

This Advisory Committee consisted of the following gentlemen: Sir Arthur Duckham, K.C.B., Chairman; Stevenson, Vice-Chairman; Black, Moir, Lever and Stephenson Kent. Duckham and Stevenson were completely freed from departmental routine work in order to be able to give their whole time to it, and many other office changes were carried through in order to relieve the burdens upon the other men as much as possible. The Committee became an invaluable agent, and the scheme, which ultimately became so fruitful, by which we arranged for the production of aeroplanes, was devised

by them. So far as stores were concerned, Ross Skinner's Department quickly got into harness, and, on the advice of the Advisory Council, Sir Gilbert Garnsey, of Messrs. Price, Waterhouse & Co., and Mr. J. H. Guy, of the Imperial and Foreign Corporation (who were already in the Finance Department) were told off to devote themselves exclusively to the clearance of store accounts. At that time something like a million articles came into account every day and the results of this prodigious undertaking will merit attention later on.

T.N.T. POISONING

During the autumn of 1916 we were greatly worried by the increasing number of deaths or cases of sickness from T.N.T. poisoning, and at that time the Research Council and our Medical Staff had not yet shown the way to prevention. The payment of weekly compensation was becoming a big item, and in connection with this subject the following note of November 20 is interesting—

"Lord Northcliffe called in to see me by appointment this morning with respect to T.N.T. poisoning. Hedley le Bas¹ has received letters from him and rather thought that he was going to open a campaign upon it. I told Northcliffe frankly what the position was and what we were doing. I think, on the whole, he was satisfied; indeed, according to Hedley le Bas afterwards, he was impressed with our activity, so that I do not think we shall have a campaign against us on that account."

This was not the only case in which happily we had been in advance with our efforts to make good our weaknesses, but it would have been a miracle if our other efforts had been as successful as this was. Organised enquiry and well-directed research were attended with success, and during the later periods of the war T.N.T. poisoning practically ceased to occur. In addition to preventing incalculable physical misery these researches saved as much in compensation as the whole cost, I believe, of the Medical Research Council from the first day of its establishment.

Lloyd George had not been long at the War Office before he sought to establish a financial control akin to that under Lever's direction at the Ministry. Hence the following—

October 5.

"One point worth recording cropped up to-day. The War Office has paid us the compliment of wanting to get hold of Lever as their Finance Adviser. This, I am afraid, we cannot agree to, and he does not want to

¹ Sir Hedley le Bas was the Director of our special Intelligence Branch.

go. It is evident that any man who went there would have to undertake a big job and give his whole time to it. For all that, we ought to help them if we can."

October 20.

"On Friday morning Sir Charles Harris came over from the War Office. L. G. had been saying to him that he meant his financial adviser to occupy the same position as Lever in the Ministry. Harris explained pathetically that finance has never yet had a chance at the War Office. He thought the office of Financial Secretary there had been regarded as a sort of Cinderella, and asked me plaintively what I thought could be expected from a man like . . . ? He said that he himself had applied on numberless occasions to be given a voice in the early stages of contracts, but that the Financial Secretary had to give way to the soldiers and it was useless unless a strong Minister were placed in charge. . . . He jumps at the present suggestion. More power to him, for he is a grand fellow—but we shall not part with Lever."

As a matter of fact, in some branches at any rate, the War Office afterwards adopted costing methods which became more severe than our own.

LIFE AT THE MINISTRY

During those busy days of rapid growth and new developments there were not many of us in responsible positions who could do anything but live laborious days and nights, and we needed and appreciated our efficient canteen arrangements as much as they did in any factory in the land, for there were few evenings possible at home, or even for many of us the usual opportunities for a leisurely evening meal. Somehow or other in an evening other people, busy like ourselves, used to imagine that then was the appropriate time for *ad hoc* conferences on all manner of topics, so that we often found our evenings engaged in that way even till late hours, apart entirely from urgent matters that cropped up.

A good many men were worn out in the process, and the death of more than one must be put down to the strain they endured. For my part I always attributed the excellent health which I enjoyed through these strenuous years to two circumstances, apart from the fact that simple living and regular manual work in the fresh air at the week-end must have fortified one's constitution. The two circumstances were, first, the untiring and utterly self-sacrificing helpfulness of my successive civil servant Secretaries, Mr. J. A. N. Barlow, and, afterwards (through the most strenuous times of all) Mr. H. H. Piggott, and Mr. M. Haseltine, with Miss M. M. White (Mrs. McVittie), who was personal Secretary all through the war; secondly, to the fact that, in common I believe with all the rest of us who successfully endured the strain, from



MR. M. HUSEINI, C.B.



MR. H. H. POGGOLI, C.B.



MR. J. A. N. BARLOW, C.B.



MRS. M. M. MACVITTIE, O.B.E.

Lloyd George downwards, neither office worries, air raids, nor anything else prevented my sleeping. It frequently happened, when some of our chiefs were looking careworn and seedy, that enquiry revealed they were sleeping badly. On the whole I am inclined to think that of all the physical aids to enduring a strenuous Ministerial life the precious ability to sleep is the most important of all.

The regular fortnightly Staff Meetings gradually became one of the most valuable institutions of the Ministry. The Heads of all the different departments used to assemble, and it came to be rather a large gathering. After an allotted time for a cup of tea and gossip, the business of the meeting began. As far as possible we were all on a level on these occasions. The difficulties, first of one department and then of another, were frankly stated, for the meeting was necessarily confined to trusted men from whom there could be no secrets, and our discussions displayed as forcibly as could be how immensely interdependent all the branches of the Ministry were. From first to last the general provider of these fortnightly Staff Conferences was Layton's Statistical Department. Whether it was tonnage of copper or the requirements of aluminium six months hence, the ingredients for explosives, or a disproportion in the delivery of shell components, Layton and his assistants produced a statement of the facts for us, properly collected from the different sources, and brought together into an intelligible statement. I think it would be true to say that the most successful of the business men gathered around us looked on an efficient Statistical Department as a first essential. It is obvious, and only common sense, that it should be so; but it was remarkable to find that this was not the case in a number of important businesses throughout the country. As far as we were concerned we could not have done our work without it. The fortnightly conferences were an education for all of us, but I believe their greatest usefulness was in promoting the solidarity and loyalty of spirit which characterised the Ministry.

In concluding this chapter, which has dealt with general events, it may, perhaps, be interesting to quote one of the shortest of the accounts of a day's doings from the diary as an example of the current routine of work and of the variety of topics that ordinarily engaged our attention.

November 9.

"There were various office interviews to-day which were mainly concerned with getting forward matters already mentioned—Roger on the general position of gas shells; Kent and Primrose on the everlasting struggles with the War Office; Lever and Mann on the Spelter question; Cadman on

Phosphorus; Strode, Miles and Beveridge on our powers in connection with issuing instructions with respect to preventing T.N.T. poisoning; Llewelyn in connection with the performances in his department of a man who, he finds, has been taking advantage of his position. . . . He will have to be got rid of. . . . There was a long meeting of the Cabinet Subcommittee on Spelter in the afternoon and we finally arranged the principle to be embodied in the terms to be made with the Spelter people, both at Queen's Ferry and at Avonmouth. We also instructed Llewellyn Smith to get in touch with Wrigglesworth of the American Chemical Manufacturing Company, with a view to seeing whether they could possibly co-operate with us and the French in the manufacture of selected intermediates. I brought up the Steel question in connection with the extensions. It has become an important War Committee question. I am to prepare a statement. Merchant shipbuilding ought to require much more steel."

CHAPTER XVII

POLITICAL EVENTS, 1916, JANUARY TO JULY

First Compulsory Service Act—Simon Resigns—Diary Notes—Press Campaigns—Public Discontent—Conservative Offers to Lloyd George—Diary Notes—Failure to Provide Sufficient Men—Position in the Cabinet—General Conscriptio the Issue—Feeling in the Liberal Party—Northcliffe Press Campaign—Crisis—Attitude of Reading and Henderson—Asquith's Statement—The Settlement of April 20—The Secret Session—Political Turmoil—Casement Lands in Ireland—Pressure upon Lloyd George—Resignation of Birrell—Asquith Visits Ireland—Carson and Redmond—Votes for Soldiers—Lloyd George's Mission to Ireland—Death of Kitchener—Asquith and Loyalty to Colleagues—Attempted Settlement over Ireland—Diary Notes—Failure of Peace Effort—Asquith's Position—Lansdowne, Redmond, Carson—The Sacrifice of Redmond—Disastrous Results—Supporters of Lloyd George—His Appointment to the War Office—Diary Notes—Dinner with Friends.

THE political issues of the year 1916 grouped themselves around four events. The first, at the very beginning of the year, and the second, in the month of April, relate to the introduction of Compulsory Military Service; the third, from May to July, was associated with affairs in Ireland; and the fourth, in the autumn, with the fall of the first Coalition Government.

As regards the first, the decision to give effect to the Prime Minister's pledge that married men who had attested under the Derby Scheme in 1915 should not be called up for service until the single men who had not attested and who were suitable, had been dealt with, made the imposition of compulsion in some form inevitable, although there were a good many struggles to escape it.

The Compulsory Service Act of January, 1916, was a surprising failure, due much more to the incompetence of the enrolment machinery than to the Act itself. Its inadequacy to meet the demands of an army of the necessary size led to an acute political crisis in April over the application of compulsion generally. It cannot be said that things settled down very much even then, but for a time at all events the likelihood of the break-up of the Government was substantially diminished. Nevertheless there were many grounds for dissatisfaction, even for those of us who had no

desire to make trouble, and I, myself, was one of those who in conversations with Ministers made no secret of it. In view of our close official and personal relations such conversations were the most frequent with Lloyd George. It was our practice to talk quite freely, and, as a matter of business, any proposals that came before the Cabinet that might affect the work of the Ministry were referred to me for comments and report.

Sometimes I made notes on political happenings on the same day, but very frequently, in addition to daily notes, I made a general summary at the week-end, and this accounts for the form of some of the extracts that follow. The first group of extracts relates to the crisis of January, and the next to the inner political movements connected with the conscription issue in April. A few only can be quoted on the Irish Crisis, and the remainder refer to the acceptance by Lloyd George of the post of Secretary of State for War, at the end of June—

January 4, Tuesday.

"The Cabinet has accepted the inevitable. There will be squabbles about the exact number of men, but, whatever it is, the pledge to married men can only be given effect to by taking compulsory powers with regard to the single men who have not enrolled. Simon has definitely resigned. Concessions are reported to have been made to Runciman and McKenna sufficient to keep them in for the present. The *Manchester Guardian* is disposed to oppose unless some very special case is shown. There is to be a Labour Conference on Thursday and it may go against the scheme. If so, Henderson and other Labour Ministers may have to resign. The Lords have not yet passed the Bill extending the life of Parliament beyond this month, so that an Election is a possibility. Seeing that married men who have attested are concerned, and rightly so, in the keeping of the P.M.'s pledge, the result would most likely be in favour of compulsion, though it is difficult to prophesy. The love of voluntary service is pretty deeply rooted. I understand that the Cabinet has not yet decided on the final form of the Bill."

January 6, Thursday.

"The House of Commons is in a stormy mood. We therefore had a good deal of difficulty with the Munitions Bill on Tuesday, but the mood was really connected with the Compulsory Service measure, and much of the feeling was directed against Lloyd George, who was largely blamed for it. The National Service Bill is the one absorbing topic. . . . The House was very crowded yesterday, shoals of men having come back from active service. On the whole, however, I think the moderate character of the Bill abated a good deal of the anti-conscription opposition. It provides for the setting up of district and appeal tribunals, and a number of grounds of exemption. Simon's main criticism of the discrepancies amongst the figures quoted, of the defects of the National Register and of the recruiting machinery generally were largely justified, but there was no getting away from the fact the Prime Minister's pledge could not possibly be kept except by the intro-

duction of some measure of compulsion. The Labour Conference is not the Trade Union Congress and has no special representative authority."

January 7.

"Yesterday was a better day for the Government, notwithstanding that the Labour Conference voted against the Bill by a substantial majority—not so large, however, as some had anticipated. . . . The fact that notwithstanding this vote eight Labour Members voted for the Bill and only nine against it is a fair indication of the importance that some of them attach to it. . . . Lloyd George meditates going down to Carnarvon and making a big speech on his own. It is still anticipated that the Labour Members will have to resign. Everybody sincerely hopes not. The House has not been so crowded and excited since the first days of the war as it was last night."

January 17.

"No fresh developments *re* National Service. The discussion on the Bill (11th and 12th) went well for the Government and the minority of 39 on the second reading indicated that things were going better than anticipated as regards the Irish. Redmond said that having registered their opposition to the principle on the Leave to Introduce, they did not intend opposing the Bill further. Considering the shocking way they were treated by the War Office in voluntary recruiting this is very gratifying. There are some elements in the Bill which a good many of us do not like. As it stands, it could certainly be used by an employer as an instrument of industrial pressure, and we at munitions cannot agree that local tribunals should revise decisions so that they might send exempted munition workers to the trenches. This ought to be put right in the Committee stage. I am glad the P.M. gave specific pledges to Labour in this respect. Henderson spoke for the Bill, so that the Labour Ministers will remain."

January 19.

"The Military Service Bill went on well in Committee. Amendments have been put down that satisfy the Labour Party with respect to the absence of industrial compulsion and we also have secured an amendment that will prevent enlistment of munition workers without our consent."

The period following the passage of the first Compulsory Service Act was occupied by the creation of the recruiting machinery and of the local and appeal tribunals. The difficulties connected with the creation and early work of these tribunals were, on the whole, less than might have been expected, but the men were not coming in, and the progress of military events on the War Fronts was disappointing. The mismanagement of the Mesopotamian Expedition, culminating in the imprisonment of Townsend's men at Kut, made things worse. There was a lack of grip, both by the India Office at Home and by the Indian Government. The outbreak in Ireland also provided ample material for the campaign that was being conducted with growing intensity by some sections of the Press against Kitchener and the Prime Minister. The personal animosity of

these attacks rendered more difficult the efforts of those who were anxious only to see more decision displayed in the management of war business ; but they provided an abundance of material for gossips and busybodies. The trouble of it was the complaints were often well founded, and, although it is not possible to say what might have been done in the absence of this Press campaign, it is certain that the existence of it cramped the freedom of effort of those who were genuinely discontented with prolonged indecision and with the continuance in important posts of men who seemed to lack the capacity or the readiness of apprehension which the times demanded.

The following series of notes relate to the period of the second Compulsory Service Act and to the beginning of the negotiations for a settlement in Ireland after the outbreak at the end of April—

March 17.

" I had a long talk with L.G. to-night and we discussed the political situation with considerable frankness. He recognises the serious dissatisfaction with the Government that exists, and there is a good deal of it among the Tory section in the Cabinet over the P.M.'s complacent attitude. L.G. had been out to Wembley with Hughes, the Australian Premier, who had given him his impressions of our statesmen. His summary was that, with the exception of L.G. and Bonar Law, most of the Cabinet Ministers he had met were men who dealt largely in words and were not prepared to put that push and energy into things which the situation demanded. There appears to be a movement amongst the Conservatives to try and get L.G. to take a strong line and they are prepared even to go to the length of recognising him as P.M. We had a long and frank talk, and I said I would think the matter over and discuss it again."

March 23.

" Another long talk with L.G. to-night. I pointed out to him that nothing could be satisfactory which separated him from the democratic party. Notwithstanding the feeling of unrest, he himself felt that the time for action was not yet come. He thought it might come late in the summer when, he anticipated, after the usual rush, the Military Chiefs in France, with their customary extravagance, would find that, having expended their reserves of munitions, they were being driven back by the Germans. I question this : they will have a great deal more stuff this year to begin with and our weekly supply by the end of the summer will be immensely greater. He felt also that between now and then there would be a consolidation of opinion in our party in favour of a more determined action against incompetency."

April 4.

" L.G. and I had a long talk over the political situation. Things are getting to a rather desperate pass in the Cabinet. The yield of the Derby's figures and under the Compulsion Bill is far short of the numbers required to keep up sixty-four divisions in France. The question of what is to be done about it has now been hanging fire for a fortnight. There have been overtures made to L.G. on behalf of the Tories as to whether he would break

on the subject. More or less informal offers were made to him that they would follow him. He says that he had told them frankly that he could only identify himself with the movement if he was going to have the support at the same time of a solid and sufficient body of Liberals. We decided to meet again and discuss the situation to-morrow."

April 5.

"Lunch with L.G. I told him that it seemed to me that it was to court failure and division if he went out purely with the backing of the Harmsworth Press and the wild men amongst the Tories and with only a small following amongst the Liberals. I recognised the urgency of forcing forward a policy to get decisions in advance and to be rid of incompetence or laziness, . . . but I frankly said that he could not expect to carry a campaign in the country unless there was a very solid case, powerful as he might be with his speeches and influential as the section of the Press that would support him was in certain directions. . . .

"He would be prejudiced anyhow with the rank and file of Liberalism if he was only supported by Northcliffe & Co., simply because it would have the appearance of an intrigue against the P.M. He agreed with this. I pointed out also that it was essential in any case, if there was to be an election, that soldiers should have votes and that therefore a Bill must be passed in Parliament to provide for it. But this could not be done by a tottering Government, and it would soon totter if a campaign were started now. He agreed, but said that he was afraid the issue might be forced, and asked me to come again early to-morrow morning and in the meantime to see a letter which Lee had sent him at the Ministry. . . .

"Later on in the day I got this letter from Davies. It was a long type-written document, evidently in the form of a draft, containing all sorts of verbiage, full of innuendoes and suggestions and practically inviting him to ally himself with a section of the Tories and go for the P.M. L.G. came in just after I had finished it and asked me what I thought about it. I said that I regarded it as a highly dangerous and mischievous document and that it was quite certain that it had not been written by Lee. I suggested that either A—— or G—— might be the author of it. He did not think it was written by Lee and suggested O. H. as the author. I told him with brutal frankness, as one was obliged to do, that I was not at all enamoured of some of those who were in it. They seemed more anxious to smash things up than to help things through. After all we were fighting the Germans. This document made me more suspicious of the pressure that is being brought to bear on L.G. than anything else he has told me of up to the present. One hardly likes to write these things, but I could not avoid the suspicion that it might force an election on a Tory issue with the Liberal Party hopelessly divided, and that the authors of this document were quite clever enough to be aware of these things."

April 6.

"Another meeting with L.G. at 10.30 a.m., and we went over the whole ground again. He pledged himself that under no circumstances would he break off unless he were driven to it by supreme military necessity. I said I thought that Harmsworth had done more to bolster up K. than anything else. His vehement animosity was enough to strengthen any man in the public mind, even if the man, as in the case of K., seemed to be unsuitable for his job. . . .

" L.G. then said that the fact was that a decision was being forced and that he must tell me frankly about it. Robertson, the Chief of the Staff, has sent in a very grave document to the Cabinet and L.G. asked me to read it with the accompanying memoranda from the Munitions as well as from the general point of view, and come back at lunch. I obtained these from Davies and went through them during the morning. At lunch-time we met again, and afterwards went over the ground. Robertson's memo. sets out the requirements to keep sixty-four divisions in France to the end of the year and the number of men that had been obtained under the Derby Scheme and from the Compulsory Service Act.

" After lunch a document came in from Amery, who had been going into the figures at the War Office. The burden of it was that it was impossible to get the men required without general compulsion. This is, no doubt, true, but it gave no explanation of the failure of the Derby Scheme that is utterly astounding. Robertson's figures show that to keep the divisions referred to in the field to the end of the year there is a prospective shortage of at least 400,000 men. . . . Either the recruiting methods and machinery are worse than one imagined or the basis of the estimate of the single men available is wrong. Probably both. . . .

" L.G. promised me to ask Robertson for more detailed figures, so that we could have another discussion upon it. He said he had told Bonar Law yesterday that he himself could not lead the Tory Party or be a competitor with him in that matter and must retain his allegiance to democratic forces whatever happened. But he is willing, if the necessity arises, and if they are driven to it by a responsible statement by the General Staff, to lay the whole facts before the nation. This is the reason why he thinks a decision cannot be postponed until July. It is difficult to see how the requisite men between now and then can be obtained by a combing of the occupation lists or by a more strenuous application of the tribunal system. The Cabinet has agreed to go into the figures and arrive at a decision before Easter. It is at least a comfort that they have decided something. General compulsion is clearly inevitable, but efficient War Office machinery is a *sine quâ non*.

" There is a lot of grumbling, which does not seem to have much in it, against the P.M., because of his visit to Rome. For all that the indications are that Bonar Law, Balfour and most of the Tories will support the P.M. . . . On the whole this has been a most interesting week, but things are becoming very anxious and critical. What makes them worse than they otherwise would be is that there are really good grounds for dissatisfaction at the lack of decision and energy in the P.M.'s conduct of affairs, but it is so mixed up with the Harmsworth Press campaign, and an element of intrigue and spite, that it is very difficult to steer a patriotic course."

April 13, Thursday.

" The political situation this week up to this evening is no better than it was. L.G. had neuralgia on Monday and told me he was going away until Friday, leaving me to deal with matters. I told him, however, that I had no doubt that I should see him again on Wednesday. This turned out to be the case, and he asked me to come and see him at No. 11 at nine o'clock

yesterday morning. He was then going down to Chilwell with Lee, Geddes, Black and others to inspect the filling factory there. Lee and Geddes seem to be out against Chetwynd. However, I am glad to say that L.G. has been very impressed with what had been done at Chilwell, so that any idea of undermining the position of Chetwynd has been squashed, if there has been one. I surmise that he has been a bit anxious to get out of the way. . . .

"Davies and I and others have warned him earnestly against allowing himself to become too much involved in a movement that may separate him from the bulk of the Liberal Party, both in the House and in the country. He told me yesterday morning that it was pretty certain that the Tories in the Cabinet would decide to stop in. I hear to-day that the General Staff have put in a document stating their point of view of the number of men required in what is practically an ultimatum. The document does not suggest how the men are to be obtained, but it states that it is up to the Government to obtain them. There have been very anxious faces on the Treasury Bench this week. Some of them are examining the War Office figures, the results of the Derby Scheme and the Military Service Act, and they are to present a Report to the Cabinet. There was to have been a meeting to consider it this afternoon. It was, however, postponed until to-morrow morning, and now I have just heard that it has been postponed until to-morrow evening. . . .

"Birrell was talking to me this afternoon and I gather from him that the P.M. feels that he cannot possibly retreat from the attitude which he had previously taken up to the effect that he could not consent to compulsory service being applied to married men. He asked me if I thought that L.G. would insist on resigning. I said that I was inclined to think that he would, unless some way could be found for obtaining the men. To tell the truth, there are few men better at getting out of a tight corner than the P.M., and I should not be inclined to think that he will fail to do so this time."

April 17, Monday.

"On Sunday morning I had a message from Barlow, the substance of which was that the account in *The Times* of the Cabinet meeting published on Saturday was substantially correct. It is really too scandalous. However, seeing that the whole of the recent discussions between Carson, Curzon, Northcliffe, L.G. and everybody else appears to be freely at the disposal of *The Times* through various intermediaries, there is nothing to be wondered at in the publication of this information. . . . The sum and substance of it, however, is that the report of the Cabinet Committee has not been accepted as a whole.

"There is a considerable amount of support in the Cabinet for the inevitable compulsion, and it is also more than likely that Robertson is very stiff and unyielding in his demand."

April 20, Thursday.

"Kellaway and I had lunch with L.G. on Monday. Reading was there too. The Army Council's is a strong document, signed by all including K., and it makes the issue, if possible, more serious than ever. L.G. at lunch was in rather a combative frame, but Reading and I did our level best to urge him, if possible, still to find a way out. I was delighted to find that Reading was exercising his powerful influence in this direction, and he suggested that there ought to be a conference of three or four of the chief men to try and work out a settlement seeing that nothing was ever discussed

properly on its merits in a full Cabinet. I am glad to say that, with Reading acting as go-between, this was arranged, and the Cabinet which had been fixed for four o'clock was postponed until after five o'clock and a meeting of the P.M., L.G. and some others was held at four o'clock. The Cabinet only sat for an hour, and the small conference continued off and on until late at night. . . .

"During the night L.G. looked up what Abraham Lincoln did in the American crisis. He took powers, I believe, to call up men as required. The result was that he brought forward a proposal that they should take powers to call up men as required, exercising the powers as and when it was found necessary. This was well received by the Cabinet, and was discussed again in the afternoon. It looked as if an agreement on this line might be come to, except by Henderson, who still objected from a Labour point of view, but the P.M. was to try and devise an arrangement. The result of this was that the P.M.'s statement in the House was postponed until Wednesday. . . .

"Yesterday morning Henderson, I suppose, after consultation with the P.M., suggested that there might be something in the way of an announcement that compulsion would have to be adopted in six weeks' time if the Government on its full responsibility said that such a step was necessary. . . . There is therefore not a great lot between the parties. . . . Notwithstanding this, however, yesterday things got worse rather than better. This was the state of affairs up to the P.M.'s statement in the House, in which he spoke openly of a possible break-up of the Government. . . .

"It was generally regarded as a challenge to L.G. I do not see much in that. They are up against a decision on general compulsion, and unless they can agree there will certainly be a break-up. Carson of course raised no petty points over the postponement of the discussion. He has a strong case ; but I am not sure whether he realises how essential is an improvement in the War Office machinery. For all that, according to Glyn-Jones's report, L.G. has a good few friends. As they pointed out, his side of the case has not yet been heard and it would be wiser to defer judgment on a friend until he had had a chance of defending himself. As Glyn-Jones put it, it is usual to give even an enemy the opportunity of making his own statement before condemning him."

April 24.

"The so-called 'crisis' resolved itself, in the first stage, on Thursday the 20th instant. That morning the Cabinet agreed to give another month's trial for enlistment of unattested married men and if 50,000 were not obtained they would introduce compulsory service on May 27. In the meantime it was decided to introduce a Bill prolonging the service of time-expired men and youths of eighteen. Some of them strongly opposed this piecemeal performance, but accepted the compromise, on the understanding above mentioned. The result was 'the Cabinet crisis' ended. It was agreed that there should be a Secret Session for the Government to set before Parliament the situation on Tuesday, the 25th instant. . . .

"There is a dismal career before the Provisional Bill. I cannot imagine how it will be justified. Lee was rather angry about the compromise and wanted L.G. to come out and perform what he felt was a necessary 'surgical operation' on the Government. I think a 'surgical operation' is necessary, but what is to be removed? And with what result?"

April 28, Friday.

"On Tuesday, the 25th, and again on Wednesday, the 26th, the Secret Session was held. The P.M.'s statement dealt with figures generally and told the House very little. It resolved itself into a statement of the additional men required at once over and above those likely to be forthcoming under existing arrangements and of those that must be trained and ready by August and September, unless the forces in the field were to fall below the strength, which he gave as seventy divisions. (This includes Egypt and Mesopotamia.) Bonar Law made a splendid speech in support of the compromise and Carson spoke vigorously. After I had heard Carson, however, I felt that office work was more important and interesting, and left the House. I heard little or nothing of the subsequent debates.

"This week has been accompanied by a strong movement against L.G. After the P.M. made the statement on Wednesday, the 19th, that unless something were agreed to the Government would break up, there was the meeting of Liberals. This was followed on Saturday by a long open article by 'A. G. G.' in the *Daily News* against L.G., accusing him of intrigue, love of compulsion, etc., etc. Some of it was sound enough, but Gardiner missed the point of what is necessary to beat the Germans. . . . Kellaway on Sunday decided to write a reply on his own and came up to the office on Monday and got it out. It was, on the whole, a vigorous and clever reply. . .

"I have arranged for a few men to collect names and opinions and we have found, during the week, a good body of Members who are strongly supporting L.G., although saying nothing about it just now, and the proceedings of the week have undoubtedly strengthened his position in demanding a clear policy. Wobbling also has received a nasty blow in Ireland as well as in the House, for last night the Provisional Military Service Bill to deal with youths, Territorials and time-expired men was received with such a chorus of condemnation that it was withdrawn by the P.M. almost immediately. It could not have been otherwise. It was compulsion for men who have voluntarily 'done their bit,' whilst shirking it for those who have done nothing."

The failure of the Provisional Bill and the strong current of public opinion made the adoption of general conscription inevitable, but the last week in April marked the complication of events by the landing of Sir Roger Casement and an outbreak in Ireland. Before connecting them up to what happened afterwards over Ireland, a few comments will suffice to close the record of the Government crisis over compulsory military service.

According to the compromise that had been arranged an interval had to elapse before Parliament could be asked to adopt general compulsion, but the Prime Minister had to announce in the House of Commons, on May 2, that in consequence of the provisional plans having found no favour, a Bill embodying general conscription would have to be introduced. The debate was damaging to the Government and gave very forcible expression to the growing

discontent. The outbreak in Ireland, the affair at Kut, charges of lack of decision, waste and muddle, and so on, found very forcible expression, and they were the expression of the hostile movements that were being actively continued outside. These movements were by no means solely promoted by members of the Conservative Party. Mr. David Davies, M.P., for example, a very stalwart Liberal, was an out-and-out champion of drastic action and wanted Lloyd George to resign forthwith, and he and a good many others visited me and exhorted me to encourage Lloyd George to do so. He was only one of a good many Liberals who were vehement against what they had come to regard as Asquith's indecisive handling of affairs, but I pointed out to Davies and the others that whatever might have been the case before, it was clearly no time now for Lloyd George to think of resigning, seeing that a decision had at last been arrived at. Nevertheless, with David Davies' help, I began to get together a list of those Liberals who were in favour of a more active policy and who would be willing to give support to Lloyd George in pressing for a more decisive conduct of war business. Although the returns were only informal and preliminary, they betrayed a great body of dissatisfaction amongst many Liberal Members of Parliament. This matter will be referred to again.

Waldorf Astor also visited me on the subject, and it may be interesting, as a concluding quotation on the subject of military service, to give a note of a little dinner party of May 1—

"The dinner with L.G. was most interesting, and I think did good with Davies and Astor. L.G. pointed out to them that it was quite impossible for him to resign now that he had gained his point after great struggles. I urged that L.G. in his speech on Saturday should take the line of saying how necessary efficiency and organisation were and that people who were not efficient ought to be scrapped in war-time and to make such a statement as would lead to the formation of what might be called 'Win the War Committees' throughout the country. He generally agreed with this and exhorted Astor and his friends and Davies and his to agitate, *inter alia*, for a Registration Bill in the House whereby soldiers should have votes. . . . I have seldom seen him in a fairer or more clear-headed frame of mind. . . .

"The Compulsory Service Bill on Thursday, 4th instant, went well. Practically the whole of Labour voted for it. It was seen that it was necessary, but I wish that some of the inefficiency at the War Office could have been made more of. . . ."

General conscription had much more nearly led to a break-up of the Government than the introduction of the first instalment of it at the beginning of the year, but after the so-called compromise was reached on April 20, the acceptance of it was inevitable. The Provisional Bill which the House of Commons very properly rejected with contumely was a discreditable and stillborn proposal. Delays

over the decision may fairly be attributed to a natural hesitation to adopt a proposal altogether new to the people and opposed to deeply-rooted prejudices. The suggestion that there should be a waiting period of some six weeks to give a last trial to the voluntary enlistment that previous proceedings had destroyed was too feeble to be tolerated for long. These features of the case were naturally seized upon by that section of the Press which had been attacking the Prime Minister for his alleged dilatoriness in coming to decisions ; in addition to them the disasters in Mesopotamia, the outbreak in Ireland, the growing uneasiness over Air Force equipment and over the enquiries into events at Gallipoli provided material for criticism which was as persistent as it was often unfair, and it was in no degree mitigated by the settlement on conscription.

IRISH SETTLEMENT ATTEMPTED

It is not necessary to give an account of the events in Ireland after the landing of Casement. There was an outbreak in Dublin on Easter Monday and risings in the west and south. The rebels were very soon ringed round in Dublin, but the rebellion itself was a dramatic and eloquent demonstration of how blunders of management had gradually frittered away the generous and loyal impulses which had been so gratifying in Ireland in the early part of the war. Everybody I think was sincerely grieved that Birrell had to resign, although perhaps he may have been too easy-going ; but he could in no way have been held responsible for the aggravations and annoyances by which the military authorities contrived to damp down Irish enthusiasm.

A few diary quotations will suffice to bridge over the events of May which led up to the appointment of Lloyd George at the end of the month to endeavour to arrange a compromise over Ireland—

May 7.

"The state of affairs in Ireland has improved more or less during the week, but the feeling against the Military for executing rebels without a public trial was strong. Much to the surprise of the House, the P.M. himself is going to Ireland to enquire into things. A matter which would be tragic if it were not almost comic emerged on Thursday : it appears that the Chief Secretaryship was more or less going begging, although I am not clear that it has been formally offered to anybody but Harcourt. It seems that Tennant is exceedingly anxious to get the job. Anything more pitiful can scarcely be imagined. There is now some talk of scrapping the present arrangement altogether and setting up a new governing arrangement in Dublin. There is a strong feeling, which I fully share, that the present juncture should be utilised for promoting an understanding between Carson and Redmond. There is a great opportunity just now for courageous and

conciliatory handling of the situation, but I am not very sanguine that, with his fondness for patched-up arrangements, the P.M. will get any very satisfactory arrangement through. . . ."

May 21, Sunday.

"I had an interesting lunch with L.G. on Tuesday, 16th, and we discussed affairs generally. . . . Neither he nor Redmond (with whom I had a talk on Thursday) knew what the P.M. is doing in Ireland and apparently also Carson is disgruntled owing to the conferences held with the Ulstermen without his being fully aware of what was going on. They do not seem to think that much will come of it. The suggestion of an Irish Executive of the different parties does not seem to be acceptable to anybody. Nevertheless, it is a golden opportunity, and I cannot but feel that an agreement could be reached on the basis of the immediate grant of Home Rule to a large part of Ireland. The indications are that it could be negotiated without great difficulty, but a lame and halting compromise would do more harm than good. By the way, L.G. told me at lunch that he had had an interview with Devlin who had had a talk with Northcliffe and found him very friendly disposed, and he exhorted Devlin to try and bring L.G. into it. The interview spoken of in the papers between L.G. and Redmond on Wednesday morning had nothing to do with these matters. It was concerned with making arrangements for a conference with the Irish distillers on Friday morning."

May 28, Sunday.

" . . . Another of my little jobs has been finished. It was to work up for L.G. a scheme¹ for giving soldiers votes and for giving them an opportunity of recording them whilst still in the Army. The memo. was sent in on Saturday afternoon. The Cabinet has accepted the principle, and L.G. proposes to circulate the scheme to them.

"Possibly the most interesting event of last week was the appointment of L.G. as Grand Conciliator in Ireland. On Monday, 22nd instant, he had a long talk with me about it, and he told me that he had been pressed by the P.M. and members of the Cabinet to accept the job of Chief Secretary. He then was thinking that he could do it and still keep on the Ministry of Munitions. I implored him to be careful, and said that if he became involved in Irish wrangles he might lose his strength in the Councils of the war. . . .

"On Tuesday, 23rd instant, he had an interview with Carson at lunch at Lee's, and I was delighted to hear afterwards that Carson was vehemently against his becoming Chief Secretary. He said he would support him and do everything he could to make his mission a success if he remained Minister of Munitions and acted simply as conciliator and would back him up with his own people; but he was vehement against his leaving the Ministry of Munitions and the War Council and running the risk of becoming involved in Irish difficulties of administration. Both L.G. and Lee told me afterwards that he became quite passionate on this subject. . . . L.G. told me on Wednesday morning that he had definitely refused the Chief Secretaryship and that they had unanimously agreed to his appointment on the terms he mentioned, practically those suggested by Carson. On Monday he might have accepted the Chief Secretaryship if some of us had not done our best to put the brake on."

¹ The Draft, as originally submitted, is printed in the Appendix, No. 10.

May 30.

" . . . I had a bit of a talk with L.G. on Ireland this afternoon. He seems to be making substantial progress. He gave me back the note on Soldiers' Votes. The only criticism he had on the scheme was that a candidate should be able to send his Election Address direct to the soldier and not through the C.O. We agreed to renew the talk to-morrow at lunch."

May 31.

" We had our talk over Ireland and Registration. L.G. said the latter was going well in the Cabinet, except that there was a more or less shamefaced movement against it as being impossible or unnecessary. He foresaw that the critical question that would arise out of Registration would be Women's Suffrage. . . ."

Although it did not interfere with his work as Conciliator in Ireland, the position of Lloyd George in the Government was affected by the death of Kitchener at the beginning of June. The dreadful news of the loss of the *Hampshire* necessarily brought the wretched personal Press attacks upon Kitchener to an end. But a word should be said upon them at this place. Some time previously, under an Order in Council, Kitchener had parted with a considerable part of his powers as Secretary of State to the General Staff, who had, in their Chief, Robertson, a determined and dogged personality. These notes have revealed that many of us behind the scenes had long entertained a conviction that Kitchener, notwithstanding his many conspicuous services, with his somewhat ironclad disposition, was not the man to be Secretary of State for War in a time when, above all things, new ideas and new methods and a ready adaptability to different conditions of war were essential. We were led to think that when he went on his mission to the Eastern Mediterranean at the close of 1915 arrangements would be made to provide him with a change of post, and, at that time, it was certainly the general intention. What events intervened to prevent the Prime Minister carrying it through, I never knew, but the unfairness of many of the attacks upon Kitchener must have made it almost impossible for Asquith to make any change unless he was to expose himself to a charge, which no amount of explanation would have reasoned away, of sacrificing a great public servant at the dictates of a section of the Press. Whatever may be Asquith's failings, a lack of staunchness, sometimes amounting almost to obstinacy, where questions of personal loyalty to colleagues are concerned, and the maintenance of the best personal traditions attached to the office of Prime Minister, could never be counted as one. In these things he provides an example which must be of enduring value in British public life, and the many declensions from it which Lloyd George afterwards permitted himself can do

nothing but make Asquith's example more estimable. He may perhaps have thought that apart from the necessity of resisting Press attacks upon Kitchener the necessities of the case had been met by the Order in Council transferring powers to the General Staff.

The attempt to effect a settlement in Ireland opened with bright promise and ended in dismal failure. This failure contributed more substantially than has often been supposed to the subsequent course of events. It may be dealt with at this place in our narrative together with the incidents connected with the appointment of Lloyd George as Secretary of State for War in succession to Kitchener.

With regard to Ireland there was a consensus of opinion that the continued suspension of the Home Rule Act and the uncertainties of the position were helping the Sinn Fein movement forward by leaps and bounds, and that very soon, instead of the loyal co-operation of Redmond and the Constitutional Party which had been so invaluable in the war up to the present, we might be confronted with the added embarrassment of a military undertaking in Ireland, and in any case would get no further help from a large part of it.

Lloyd George succeeded in reaching a provisional agreement with the Irish leaders, and there was no uncertainty as to its terms with Carson on the one hand, and with Redmond, Devlin and their other colleagues on the other, for the terms were committed to writing and subject to the most meticulous consideration before either Redmond or Carson went across to Ireland to try and obtain the acquiescence of their followers. Both men took great risks, and the desire of both of them to get an agreement which could rapidly be embodied in law was indeed passionate. Carson realised that the position was playing into the hands of the Kaiser and that it was necessary not only for his own people in Belfast but for the Conservative Party at home to be willing to make great sacrifices. He was as conscious as anyone could be of the immense addition of strength that a settlement in Ireland would bring to us, not only at home, but in America, where the value of it could scarcely be exaggerated.

When Redmond and Carson went to Ireland there was agreement upon the provisional exclusion of the six Ulster counties and on the retention of the Irish Members during the provisional period at Westminster. "The (Home Rule) Bill" was "to remain in force during the continuance of the war and for a period of twelve

months afterwards " and, as an addition, in order to meet Carson's misgiving as to what might happen at the end of that twelve months under the existing Act, these words were added: " But if Parliament has not by that time made further and permanent provision for the Government of Ireland the period for which this Bill is to remain in force is to be extended by Order in Council for such time as it may be necessary for Parliament to make such provision."

It is not possible to quote many of the extracts of the Diary which refer to this business. The following relate to the period of the Conferences of the leaders with their followers in Ireland, and to the beginning of the opposition of some Conservatives in the Cabinet—

June 16.

" . . . It is evident that the operation of Martial Law has produced almost a religious fervour in favour of the Sinn Feiners who were shot and has made the position of Redmond and his party exceedingly difficult; also the priests, apparently, are actively against a settlement for some reason. L.G. said he was quite sure that, if, at the forthcoming convention, representatives came unbound by pledges, Redmond would carry the day; otherwise the issue is still doubtful. . . ."

June 19.

" . . . I see that the *Morning Post* is making trouble over Ireland. . . . Selborne and Lansdowne are now taking up a line against the Irish Compromise and have, I understand, threatened resignation."

June 22.

" As a result of the Irish business the proposed transfer of L.G. to the War Office is held up, but he is having friendly discussions with Robertson, and, from what he told me, will be able to arrive at a friendly arrangement with him as to powers, etc. He also said that he thought that Devlin and Redmond would carry the Irish Nationalists. . . ."

June 26.

" There were no further developments with the Irish business over the week-end, except that it is pretty certain that Selborne at least will resign—or indeed has resigned. L.G. bet the P.M. a box of cigars that Long would not resign. I told him I should soon be across asking for a smoke. Selborne and some others are trying to make trouble in the Tory Party in the House, but they are not meeting with much success at present. Selborne, anyhow, is frank about it and has resigned; the others are hanging back for the present. . . . Lansdowne is the most influential of those against. . . ."

July 4.

" . . . There is a stiff fight going on over the Irish proposals, particularly with Lansdowne and, I understand, Walter Long. . . ."

The Irish leaders had every reason to believe, if words meant anything and there was such a thing as Cabinet solidarity at all, that, if they could secure the assent of their followers in Ireland

to the form of words that had been agreed, a Bill would promptly be introduced to give effect to it.

Redmond's statement (of July 24) was correct when he said that on their consenting to have a clause added specifying the maintenance of imperial authority for the Army and Navy, etc. (although it had not previously been in question), they were assured that this would enable Lansdowne and his friends in the Cabinet to consent to the agreement being carried out. That this was so, notwithstanding the movement of opposition which had arisen, was fully confirmed by Asquith's own statement in the House of Commons on July 10, when he said that, "In view of the agreements which had been publicly come to in Ireland and of the supreme importance of preserving the unity of the Government in this great crisis of our history, we are all willing to share the responsibility of now submitting them to this House and recommending their acceptance by Parliament."

Asquith supplemented that statement by announcing that a Bill embodying the proposals would be introduced. Although there had been unwarrantable delays, there is no doubt that if the Bill had been proceeded with promptly the agreement would have been given effect to, for whatever might have been the mood of Lansdowne and a few Conservatives, Parliament and the country—in view of the incalculable importance of a settlement—would have insisted upon giving effect to an agreement which had the support—to the surprise and delight of us all—of the long-contending factions in Ireland and which was consistent with the maintenance of Imperial interests. Every day that was lost, however, was making the position worse, and a section of the Conservatives, of which Lansdowne was by far the most influential, were busy consolidating opposition. How Lansdowne, notwithstanding his statement earlier on in the House of Lords, could remain a Member of the Cabinet after the Prime Minister's statement of July 10 and continue to organise opposition to the execution of the agreement remains a puzzle so far as I had or have any knowledge of what happened.

This little note of July 17 is a fair example of the recurring comments of the first three weeks of July—

July 17.

" . . . There is much disgust with the P.M. and the way he has messed up the Irish business. He has never displayed any firmness or decision in connection with getting the Bill forward. L.G. tells me that he has constantly been pressing for its introduction whilst the P.M. has been trying compromises, first with one man and then with another, with the result that the situation is getting very serious. All the hostile forces are

mobilising ; Redmond is becoming very suspicious, and rightly so, and generally things are very unsatisfactory. . . ."

As Redmond's uncontradicted statement in the House of Commons on July 24 showed, the decision against carrying out the agreement was really arrived at on July 19, and how the Prime Minister came to promise a Bill on July 20, when four days later he had to announce the intention of not introducing one at all, must remain another mystery. It had then been decided not to give effect to the agreement in the Bill in the words which the different leaders had carried over to Ireland, and Lansdowne's opposition had practically secured that if there was a Bill at all it should provide for the permanent exclusion of the six counties instead of leaving the future conditions to be determined after the war, as provided in the agreement which was taken to Ireland. Redmond, of course, could not accept this. It was specifically contrary to the words and intention of the agreement which he had carried with great difficulty in Ireland, and the hope of a settlement was gone. The statement of Redmond on July 24, in his historical account of what happened, was not in fact controverted in any essential particulars either by Lloyd George or by Carson. He had, in proof, abundant documentary evidence in his possession.

What really happened was that two or three precious weeks were wasted after the return of the leaders from Ireland, and the responsibility for the breakdown rests not so much upon Lansdowne and the body of the opponents, which at first was small, but upon the Prime Minister himself, who by indecision and a lack of prompt and courageous action missed a golden opportunity. There was an agreement. He himself announced it. Not only so, he announced that the Cabinet was willing to give effect to it. Redmond had risked his own political existence and the existence of the Constitutional Irish Party in trying to secure its acceptance. Against it, with all its precious benefits, there was, at first, only a handful of obstructive and reactionary men who have never made any constructive contribution to the Commonwealth, and so far as I know neither then nor afterwards were any of them of any particular service during the war. What was the loss of Lansdowne and a stand-up fight for a few days with a handful of men (who could not have received any public support) to be compared with the immense benefits to be obtained? Carson and the great interests that he represented would have stood loyally by their bargain? It was the only means whereby the patriotic Redmond could stay the progress of the Sinn Fein movement ; it was the only preventative of a dismal struggle with our fellow-citizens when our undivided

energies were wanted for the war. Redmond said: "They have disregarded every advice we have tendered to them, and now in the end, having got us to induce our people to make a tremendous sacrifice and to agree to the temporary exclusion of six Ulster counties, they throw this agreement to the wind, and they have taken the surest means to accentuate every danger and difficulty in the Irish situation."

None of us then could know how awful the consequences of this blunder would be, and the years of struggle, the destruction and slaughter that we should have to endure before a form of government was set up in Ireland that entailed far greater sacrifices by the Unionists than those demanded in 1916. In those days I was only an Under-Secretary, but I had, I think, a considerable measure of influence with Lloyd George, and many of the previous quotations from my diary show that up to that time I had unremittingly used what influence I had to secure his continued membership of Asquith's Government and to prevent a break. But from that time onwards I never could feel any heartiness in defending Asquith, for I was convinced, and still am, that his was the major responsibility for the disastrous ending of these Irish negotiations. His conduct of this business had more to do with determining the attitude of many Liberals, myself included, in the following December, than any other circumstance; and many of them told me so in emphatic terms.

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The first, second and third quarters of the year had now witnessed an internal turmoil that threatened the existence of the Government, and, although we had no desire or intention to foment any revolt, I made it my business by the aid, particularly, of Kellaway and Glyn-Jones, to confirm the record of those Members of the Liberal Party who were specially friendly to Lloyd George. He was blamed for the campaign against Asquith, but I had no evidence that he was responsible. His Cabinet position had necessarily brought him into close relation with Carson and many of the Conservatives, but any overtures or suggestions that he may have received from them were not accepted. So far as those Liberals were concerned with whom I was in touch there was no question of intrigue about it; we were simply supporting Lloyd George because we thought he was in favour of an active and vigorous policy, and we resented the activities of Gulland and the Whips who would persist in making it a personal issue between Lloyd George and Asquith. It was this more than anything else that decided me to get together a list of Lloyd George's friends. Disgruntled as we were, however, over the management of the Irish business, nothing could be done

about it. The war was first and last, and the following extracts relating to the appointment of Lloyd George to the War Office show that at that time there was no thought of disruption.

June 12, Monday.

" . . . On Tuesday, 6th instant, we had the awful news of the loss of the *Hampshire* and of poor Kitchener and his staff. After all, perhaps, so far as K. is concerned, it is as fine an end as he could have wished. He was embarking on an important enterprise in the service of his country.

" Later on in the week there was a good deal of discussion about the position of L.G. and the War Office. I saw him twice about it, and, although he was a bit attracted, I was glad to find on Friday morning that he thought he should decline to take it. I put it to him that this might mean, unless the Ministry were amalgamated with the War Office, that Munitions might be handed over to — or —, neither of which any of us would approve of. . . . Moreover K. had surrendered a large amount of his powers to Robertson and the Staff, and L.G. would not be satisfied with an office without power. If he went, however, he must make up his mind to stay there for a good time. . . .

" . . . It may be his duty to take the War Office if he is given sufficient powers to be really effective, but, without sufficient powers, he would only place himself in conflict with the Army—or at all events with the Staff—and might not be as useful there as he is at Munitions and on the War Council. He told me that Bonar Law would not want to go to Munitions, but he thought that, although others were likely, the P.M. would want Montagu to be appointed. . . .

" Generally, during the week and including a conversation which he and I had late on Friday evening, his feeling was that he ought to keep the two offices if he could. An important consideration was that a large number of the big business men in the Ministry felt a great allegiance to L.G. Lever expressed it to me at lunch on Friday, 'If L.G. goes, unless he is succeeded by yourself, there is considerable fear that a process of disintegration may set in.' If he does not hold the two offices, I think L.G. may press for my being appointed, but it is not possible in view of the claims of Members of the Cabinet. Montagu would do the job quite well. He would leave me, I have no doubt, a good deal of the general administration control as I have already and I could help him with the Staff. . . ."

June 16.

" Last night, at 5.30, I received a message from Davies to the effect that L.G. would like me to dine with him at Sir George Riddell's, at 20 Queen Anne's Gate. The company consisted of L.G., Riddell, Robertson Nicoll and myself. We had an interesting talk during dinner on all kinds of war and personal topics. L.G. told us an interesting story about K.'s ignorance of home conditions. One of his biggest fights with K. had been over the question of the provision of chaplains for Nonconformists in the Army in the early days of the war. K. knew nothing about the different sects and could not see why one chaplain would not do for the lot. However, after L.G. had carried his point, according to his description, K. brought out a sheet of paper to take the names down of those for whom he was to provide chaplains. The first was Methodists (which he insisted on L.G.

spelling for him), and finally he went away with a list. The story went round, though I have no doubt it was a fabrication, that afterwards in the War Office a memo. was found on K.'s table to the effect that provision had to be made to meet the requirements of the "Baptist Jews"!

"After we had got rid of coffee, L.G. said, 'Well now, I want to discuss with you gentlemen a big decision which I have to take to-morrow.' He said, 'I have to see the P.M. and give him my answer about the War Office which has been formally offered to me.' We had some general conversation on the question of powers. Robertson Nicoll was vehement that L.G.'s duty to the nation was to take the office and get the powers, as he certainly would, even if he began with less than he felt he ought to have. He said that the effect of L.G. going out of office would be deplorable. I should have said that L.G. stated that he had told the P.M. that he felt he had done his work at Munitions and thought that Ireland was going to come out all right and that he wanted to speak freely about things to the country and could not do so whilst he was in the Government. The P.M. had implored him to put any such thought out of his mind, and said that it was utterly impossible for the Government to spare him. Eventually, however, they had not come to any decision as to the powers that L.G. was to possess, if he took the War Office.

"The unfortunate thing is that the Order in Council transfers certain powers of the Secretary of State to the C.I.G.S., so that, as things stand, the S. of S.'s powers are very shadowy in many respects and much less than those of the First Lord of the Admiralty. I said that I thought Nicoll had overstated the ease with which L.G. would get the powers back if he did not possess them at the beginning, because the military machine was very difficult to deal with when against you, and was inclined to make use of all the powers that it had. I reminded them that for five months we had struggled against the Ordnance Board and, although Parliament and the country wished L.G. to have all the powers he required, it was all that time before we obtained them. A struggle between him and Robertson at the War Office would not be for the good of the armies. We were unanimous that, if L.G. could get a sufficiency of power, it would be unpatriotic of him to decline the office; also that if he accepted it, he must stay and see the thing through. This was agreed to by L.G. He said, however, that, knowing the P.M. as he does, he foresaw great difficulties in inducing him to take the line of altering the Order in Council or telling Robertson that he must surrender powers to the Secretary of State. We agreed that it was *sine qua non* that L.G. must have in his pocket sufficient powers from the P.M. and that we could trust him to square matters up amicably with Robertson. The chief work for him there is to press for a real co-operative plan of campaign amongst the Allies and to use his great influence with them to bring them into line—a thing Robertson would be unable to do. If he holds out he will get the powers he ought to have, for the P.M. could not spare him—or dare not risk L.G. declining the office on the ground that he was not allowed to have such powers as should properly be exercised by a Secretary of State.

"With regard to the position of the Munitions Office, we agreed that he ought, if possible, to combine it with the War Office. I walked home with him and we discussed this more freely between ourselves. He said that he agreed that this would be the right thing to do, leaving me mainly in general charge of Munitions, with Lee doing his departments, but he thought Asquith would kick at the amalgamation of the two offices, and that he wanted Montagu to have Munitions. . . ."

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June 30.

"Breakfast with L.G. He has decided to go to the War Office. Lee apparently wanted to be his understudy, but they have decided to give it to Derby. . . . I am afraid that Lee will be disappointed. . . . It is still undecided who is to have Munitions. . . . There is some talk now that Curzon may be appointed. We should manage all right with Curzon. Our breakfast was rather spoiled by the intrusion of people who had simply come to talk."

CHAPTER XVIII

POLITICAL EVENTS, 1916. JULY TO DECEMBER FORMATION OF THE FIRST LLOYD-GEORGE GOVERNMENT

Cabinet Disagreements—Misfortunes in Mesopotamia—Henderson becomes Labour Adviser—The Roumanian Disaster—BREAK-UP OF THE ASQUITH GOVERNMENT—Diary of Events from November 28 to December 9—Bonar Law and the Conservatives—Lloyd George's Demands—Agreement of Sunday, December 3—*The Times* Article—Breakdown of Monday, the 4th—Asquith's Resignation—Meetings at Downing Street, at the War Office, at Carson's House—Bonar Law asked to form a Government—Offer to Asquith—Lloyd George asked to form a Government—Conference of Five at the War Office—Attitude of Bonar Law, Carson, Talbot, Balfour and Conservatives—Negotiations with Labour—Montagu—Feeling amongst Liberals—Supporters of Lloyd George—Lloyd George appointed Prime Minister—His First Ministerial Dinner—General Remarks.

JUST before the announcement of the failure of the negotiations concerning Ireland, an incident occurred in the House of Commons which, in its revelation of indecision and internal disagreements, greatly added to the discredit of the Government.

Definite proposals had been submitted to the Cabinet for preparing a register and for making arrangements to provide that, if there were an Election, the soldiers should have some chance of recording their votes. It needed no argument to satisfy anyone that the men who were fighting for the country in France should be given a share in deciding upon who should carry on the war ; and in the discussions on the Parliament and Registration Act of December, 1915, an explicit pledge was given that arrangements would be made to secure that soldiers had an opportunity of voting. But nothing had been decided about it, and hence the memorandum referred to in the previous chapter that I had prepared for Lloyd George. He brought up the subject in the Cabinet, but they could not agree about it ; and on Wednesday, July 19, Samuel submitted a Motion for a Select Committee to consider not only whether it was practicable, but whether it was " desirable to prepare a new Electoral Register." He recommended the suggestion to the House in one of the most amazing speeches that I had ever heard from a Minister

in support of his own proposals. Carson fell upon it with tooth and claw, and I think that practically every Member of the House agreed with him.

The incident is recorded in the following note of the next day—

" . . . As I said earlier on, the Cabinet could not agree about votes for soldiers and registration business, and the question of Women's Suffrage is bound to come up. Herbert Samuel tried to pass it on to the House of Commons in proposing a Select Committee in an atrocious speech designed apparently to throw cold water on the whole business. I am glad to say that the House revolted and threw out the whole Select Committee suggestion. Similarly, the House is insisting on more light on the Mesopotamia muddle. It is almost incredible, but L.G. told me that it was not decided until Wednesday last that the War Office should equip the expedition. It is the usual inter-departmental rivalry, and the Mesopotamia business has been made a mess of because the India Office would insist on dealing with it and would not permit the War Office to touch it. . . ."

The outcry over the mismanagement in Mesopotamia had been steadily growing in volume and vigour. The Indian authorities managed it badly, and the India Office at Home seemed to have no grip upon it. The comments upon it in my notes contain little more than ordinary departmental criticism, and there is no special point in reproducing them ; but it may be interesting to refer to one or two other matters before coming to the description of events in December.

Henderson told us quite freely that he felt like a fish out of water at the Board of Education, and, indeed, his time was largely taken up in dealing with labour matters at the Ministry of Munitions and elsewhere. At the beginning of August he was appointed General Labour Adviser to the Government Departments, and gave up his duties at the Board of Education. Lord Crewe was appointed to the Board, and it is interesting to note, as a beginning of reconstruction efforts, that a Committee was appointed to deal with the educational needs of the future. I myself was a member of it, and its constitution and reference are recorded in a note made on September 6. But there must have been a good deal of " window-dressing " about it, for neither then nor afterwards did it transact any business.

The note is as follows—

September 4.

" . . . There was a letter from Vaughan Nash from the Prime Minister inviting me to become a member of a Cabinet Committee on Education which the P.M., as Chairman of the Reconstruction Committee, is setting up. The Committee has the following terms of reference—

" To consider the system of education as a whole ; to review and formulate from that point of view proposals for developing it, particu-

larly in directions indicated as desirable or necessary by experience gained during the war, and with special reference to—

- “(a) proposals prepared before the war for the development of the national system of education;
- “(b) the memoranda already submitted by the Education Departments for the consideration of the Reconstruction Committee;
- “(c) any proposals submitted hereafter from the departments or from special committees, or from other responsible organisations;

and to recommend from time to time such action, whether by way of legislation or otherwise, as may be practicable.”

The Committee consisted also of the following—

Lord Crewe (Chairman).
 Mr. Austen Chamberlain.
 Lord Curzon.
 Lord Haldane.
 Mr. Henderson.
 Mr. Tennant.
 Mr. Steel-Maitland; and myself.

Another event which, besides mismanagement in Mesopotamia, contributed to the discredit of the Government, although undeservedly in this case, was the disaster in Roumania. The following notes may be of interest in that connection—

“*September 21.*

“ . . . Everybody had a good deal of scepticism about Roumania actually coming in until the final step was taken and, as I have said in this diary before, we were holding off doing much in the way of munitions for them as the Government had been let down rather badly in the matter of the Roumanian Loan. Now, amongst other things, we are supplying large quantities of small arms ammunition, and shall have to do a good deal in the way of machine-guns at an early date, apart from heavier stuff. The difficulty, of course, is that everything has to be sent round either by Archangel or Vladivostok. We have had some considerable experience of what is involved in getting things through Russia. It is almost laughable, if it were not so tragic. . . .”

“*November 23.*

“ . . . Lloyd George told me an interesting piece of news in connection with the attacks which were made upon him early in October for trying to dictate to the General Staff. He was emphatic that assistance should be sent to Roumania. Robertson and the Staff, however, were against him, on the ground that it was impossible for the Germans to get guns, etc., into Roumania over the passes at this time of the year. . . . He gave me a copy of a letter which he wrote to Robertson on September 4. This week, as we know, the Germans have broken through into the Roumanian Plains, with what result we do not know at present. . . . If the letter had

been written this week, it could not have been better put. Nevertheless, with geography as it is, it is difficult to see how we could have sent them much effective help."

In the letter referred to, Lloyd George recalls apprehensions he had expressed that Hindenburg, with his strong eastern proclivities, would direct his attention to the crushing of Roumania, and emphasised the necessity of our being prepared, if possible, to avoid a repetition of the Serbian tragedy. In that case we had been warned in advance that the Germans meant, in conjunction with the Bulgarians, to wipe Serbia out, but, notwithstanding this, owing to the lack of equipment and appropriate transport when our troops landed at Salonika, they could not help the Serbians. It was urged that we ought to do everything we could to prevent a repetition of similar events in Roumania by sending every possible supply. It was difficult to think that Bulgaria would have declared war against Roumania unless Ferdinand had received assurances of German assistance. The slackening of the attack upon Verdun by releasing guns and troops also indicated that the Germans were contemplating assistance. The letter went on to point out that the Roumanians were very badly supplied with heavy guns and ammunition for more than a few weeks, and it was therefore urged that, in conjunction with our Allies, we should promptly consider what assistance we could give. The real difficulty, as forecasted in the note of September 21, was the getting of supplies to the Roumanians. What this meant will be better understood when we describe hereafter our efforts to help the Russians and what happened to some of the things we sent there. The Russian transport arrangements, even for their own armies, were utterly deplorable; and how things could have got forward to Roumania when they did not even send along their own supplies it is impossible to conjecture. Nevertheless, the Roumanian disaster, coupled with other events, served to precipitate the crisis of December.

FALL OF THE ASQUITH GOVERNMENT

I was at some pains to write a connected account of the circumstances connected with the formation of Lloyd George's first Government in the first week of December, and, except that some portions must necessarily be omitted, it was a faithful record of what happened so far as I knew it, and may be quoted as such. I had no direct knowledge, beyond what is intimated, of the earlier stages of events or of the discussions between Lloyd George and his Conservative colleagues, or amongst the Conservatives themselves,

or of the action that Lord Beaverbrook and others are reported to have taken. References to them are omitted, and the story is confined to what came within my personal knowledge—

December 4, 1916 (Monday).

"I must now put in, in some connected form, an account of what has been happening during the last few days. It represents the accumulated effect of a long series of muddles. As this diary has shown for about two months now, the reports and recommendations of the Man-Power Board have been before the War Committee without clear decisions resulting, but with most disturbing effects. After months of talk it was settled the other day that we should take over the supply of aeroplanes. Three weeks or more ago, it was announced with rather a flourish of trumpets that a Food Controller was to be appointed, but there is no settlement yet as to what his powers and duties are to be, or as to who is to be appointed. One could give a much longer list of indecisions and procrastinations if it were necessary. They can be found by anyone who dips into the Press.

"On Tuesday last, November 28, I saw Bonar Law on the question of the Belle Isle iron-ore deposits. After we had finished discussing that business he closed the door and said, 'Do you think we can go on like this, Addison?' meaning, of course, the Government. I said that, so far as I could see, making every allowance for the complications involved, those of us in departments thought that the grossest inefficiency was being allowed in some places; there was no machinery and no lead; the public wanted a strong lead and welcomed it, was ready, even, to forgive a wrong decision as long as they saw that something definite was decided; and I quite thought, if it went on much longer, that the Government would be dismissed both by the public and the House of Commons and would deserve it. Bonar betrayed no surprise at this summary of the situation. It seems that he was to have a meeting with his chief Conservative colleagues that night to consider what they were to do.

"I saw L.G. on Wednesday, and on Thursday. He had taken the bit between his teeth and was determined to make a finish of it so far as he was concerned. Of course, the Roumanian business was, so to say, the last straw with him. There is the same toleration and indecision over shipping and innumerable Board of Trade matters. He had apparently been discussing the matter with Carson and others. He says that he is not keen to be P.M. but is determined that there shall be a small War Committee entirely emancipated from departmental committees which could drive along and get decisions made. . . .

" . . . On Friday morning L.G. saw the P.M. and practically delivered his ultimatum—or at all events stated the conditions which he regarded as imperative for the successful continuance of the war, and said that, short of them, he could not accept responsibility any longer. . . ."

December 9.

"I have not been able to continue these notes since I began to dictate last Monday evening. That note brought affairs up, so far as any special knowledge of mine was concerned, to the interview with L.G. on Friday, December 1. Since then I, myself, have been brought into it in a way entirely unexpected, so that I can scarcely continue the story with the same detachment as heretofore.

"I went across to see L.G. at the War Office on Friday evening, Decem-

ber 1. (The note of the 4th was referring to our conversation.) . . . He was telling me that he had insisted on a small War Council, free from departmental worries and able to devote its whole time to the work. He had also insisted that the Chairman of it should be free from Parliamentary duties. The Tories had agreed with him, and Bonar Law had been charged with impressing upon Asquith the necessity for the change . . . L.G. told Asquith that he must insist on a change of this kind as a condition of going on. The result was a crash.

"I had a talk to Montagu on Friday evening. He was nervous and fidgety beyond words but was anxious to use all his efforts to bring about an accommodation. I knew no more about things directly until Monday, and the first account I had was, second-hand, from Montagu. He and one or two others, including Stamfordham, had made great efforts to secure an adjustment, and on Sunday evening an agreement was come to on the basis that there should be a War Committee on the lines of L.G.'s demands, free from departmental responsibilities, and that the P.M. should be responsible for the general work of the Cabinet and Parliament, but, apparently, should not be a member of the War Committee. He would, however, have the right of initiative and veto, subject to the assent of the Cabinet.

"On Monday morning, December 4, a report of the arrangement appeared in *The Times*, with a leader representing that it would reduce the P.M. to a nullity—which I am afraid it would. The agreement of Sunday night was known to a good many people and various versions of it were talked about during the day. I do not know the source of Northcliffe's information, but the facts appeared to be known to a good many. He has been pursuing a vendetta against Asquith, and possibly put the case in the form it was in order to make the position of Asquith impossible. However, Asquith wrote a letter to L.G. on Monday morning referring to the article in *The Times* and withdrawing from the agreement on Sunday night. I can scarcely think that the article was the reason why he withdrew from the arrangement. . . .

"On Monday morning some of his Liberal colleagues . . . busied themselves in endeavouring to upset it. . . . They got together at No. 10 and represented that the whole thing was an affront to Asquith. The fact is that L.G. is to — and — a sort of King Charles' head. . . . There is little doubt, however, that owing to their pressure the breakdown became final. There was also this further calculation that, with all of them standing out, neither Bonar Law nor L.G. would be able to form a Government, and that Asquith would have to be sent for by the end of the week. The result was, L.G. sent in his resignation. . . .

"After the receipt of this there was another meeting of the Liberal Members of the Cabinet with the P.M., and they decided, in view of the fact that L.G. had resigned and that they could not rely upon the co-operation of the Tories, that there was nothing for it but to resign, and this the P.M. accordingly did.

"On Tuesday, December 5, after Asquith's resignation, the King sent for Bonar Law and asked him to form a Government.

"It was on Tuesday evening that I began to come into affairs directly myself. I got a telephone message from the War Office about eight o'clock that I was wanted immediately. There was considerable excitement. . . . Davies told me that he had received a message from L.G. that I was to be got at once, wherever I was. I went into his room and found Bonar Law and Carson. They told me that the King had asked Bonar Law to form a

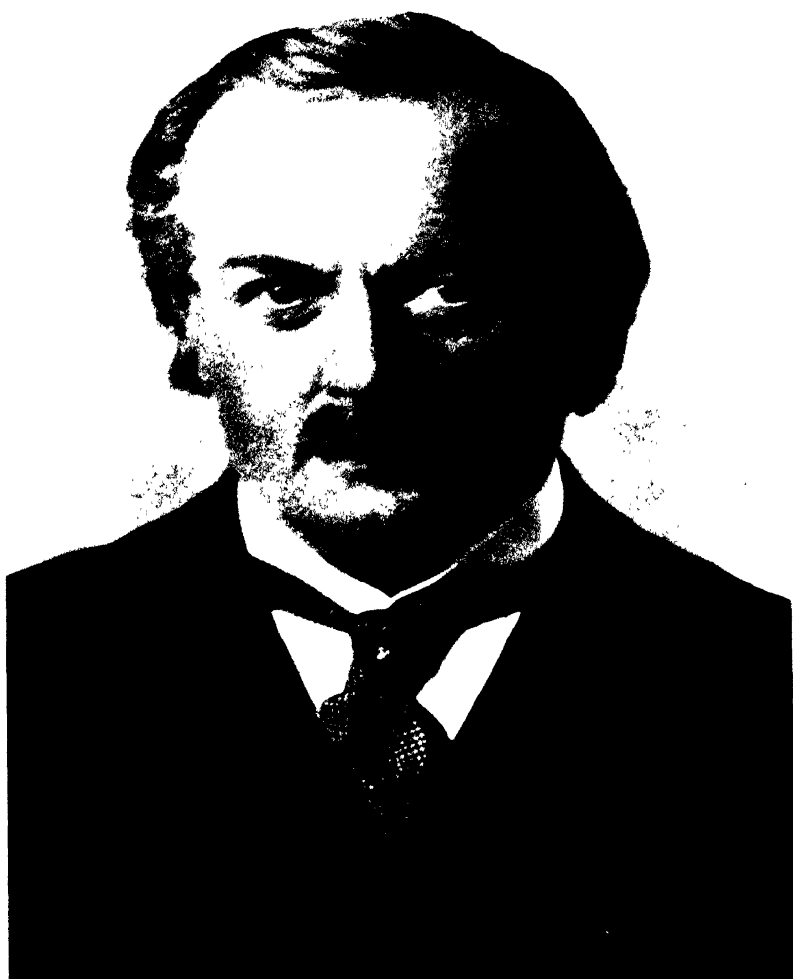
Government ; that L.G. had told them that they could rely upon me to support him, as I had previously told him I should even if I were the only one left, and they asked me to attend their councils. From this time onwards I took an active part in what was going on. We decided, after a preliminary talk over policy in connection with Labour and Ireland, that Bonar Law should go to the King and express his willingness to try and form a Government and meet again at Carson's house at ten o'clock. . . . We met accordingly, and, after half an hour's discussion, decided that it was wise, as a preliminary, that Bonar Law should offer Asquith a post in his Government, preferably the Lord Chancellorship. Bonar Law went straight away to No. 10. During his absence Carson, L.G., and I had a heart-to-heart talk on Ireland, and I am glad to say that Carson is keen, if possible, to get a settlement and will go a long way. . . . He heartily agreed that if a Government could be formed, the liberation of the interned Irish prisoners should be a first step. It was, however, recognised that if Bonar Law failed to obtain the support of Asquith, he would probably not have sufficient Liberal support as to be able himself to form a Government. . . .

" Bonar Law arrived back about eleven o'clock. Asquith had declined. We then continued the discussion of ways and means, the objections that this party and the other might entertain, what policy was to be pursued in regard to Labour, and so on. In order that no stone should be left unturned to secure, if possible, the inclusion of both L.G. and Asquith, it was decided to suggest to the King that there should be a conference on Wednesday with Asquith, Balfour, Bonar Law, L.G., and Henderson, and a further endeavour made to arrive at an adjustment. . . .

" The conference was held on Wednesday morning, and, according to the reports they all gave, Asquith was inclined to come in. However, when he got back to No. 10, a meeting of his former colleagues seems to have been ready for him ; and the sequel was, that, an hour or more later, he sent word that he regretted he was unable to join. Upon this, Bonar Law, realising that the position was impossible for him, went to the Palace and reported that he did not feel able to form a Government and advised the King to send for L.G., which he did during the afternoon. I was asked to be back at the War Office early in the evening, and there met L.G., Bonar Law, Carson and Talbot. . . .

" During Tuesday there had been some movement amongst the Tories . . . against co-operating with L.G. We felt certain, however, that, with a little friendly negotiation, this opposition would be got over. I was greatly struck by the loyalty of all the three men to L.G. and his programme. We finally separated and agreed to meet again about ten o'clock and set to work to try and get together a skeleton of a Government. I went to dinner at the Reform Club and found the place humming with excitement. The Whips were very busy and foolishly very jubilant. Some of them came to me and, evidently more in sorrow than in anger, seemed to sympathise with me, as they thought I was the only one who at that time had decided out and out to support L.G. I suggested to them that perhaps it might be desirable to moderate their transports, as L.G. was not a man without resource, and that some of those helping him might conceivably be possessed of ideas also. I also pointed out that it was within the bounds of possibility that there were more pebbles on the beach than had hitherto been kicked up by the Chief Whip. . . .

" The fact was that on the Monday, Kellaway, Glyn Jones and I had gone through the list of Members of Parliament which had been made in



THE RT. HON. D. LLOYD GEORGE, M.P., O.M.

Photo by A. Smith

the summer-time when a crisis was threatened. We divided them into 'doubtfuls' and those whom we thought to be 'for' L.G., and I arranged for a small band of men to canvass round and report through Kellaway. By Wednesday evening it was certain that L.G. was going to get a good deal of support, and that a large number of Members would support him if he succeeded in forming a Government. . . . They realised that our first duty was to fight the Germans. I had a preliminary list of them in my pocket all the time that I was being sympathised with at the Club as the only Liberal follower L.G. had.

"The five of us reassembled at the War Office at ten o'clock, and made great progress. Whatever may be the sequel, I shall always be proud to think that I was able to contribute a good many suggestions of men that were accepted. . . . We got a long way with the chief offices in a provisional form, and it was agreed that the first effort on Thursday morning should be to secure the concurrence of the Conservatives and to try and obtain the support of Labour. . . ."

Carson and I acted as clerks to this meeting, and, at the end of it, I gathered up the sheets of paper which furnished the results of our deliberations, full of hieroglyphics and scribbled notes, with suggestions for alternatives, or for people to be seen on the morrow, and, for safety's sake, I carried the two chief copies of these much-thumbed sheets of paper in my pocket until Saturday, and they suffered a good deal in the process. It would not be fair, of course, to publish them, as they bear the names of several persons who were only discussed, and the handwriting of more than one of us; but they show that, subject to consent that night, or on the following day, agreement had been reached as to the principal offices. For a few hours there was a pretty strong movement amongst important Conservatives for refusing to co-operate with Lloyd George, but the emphatic and unhesitating adherence of Balfour, when asked to take the Foreign Office, together with the loyal and open co-operation of Bonar Law and Carson, settled the issue. Subject to consent, the membership of the War Council was agreed upon on the Wednesday evening, and an offer of office was to be made to the following: Curzon, Milner, Cave, Balfour, Long, Derby, Chamberlain, Cecil, Munro, Stanley, Duke, Illingworth, Henderson, Barnes, Hodge, F. E. Smith, and Gordon Hewart. A good many more were marked with queries to be discussed as the prospects of progress developed.

December 9 (continued).

"During Wednesday, Kellaway had had a long talk with J. H. Thomas, who has considerable influence in the country, and I, too, had a talk with Thomas and some others. Kellaway was to dine in the evening with Hodge. Late on Wednesday night I was able to report that L.G.'s following amounted to 49 out-and-out supporters, whatever happened, and 126 others amongst the Liberal Party who would support him if he could form a Government. On Tuesday night Bonar Law had been rather disposed to

look upon me as very sanguine when I told him that there would be a good list and a stampede in a day or two. However, the reports which came in on Wednesday evening cheered him up mightily. We arranged that Thomas should come to breakfast with L.G. and me at 8.15 the following morning at David Davies' flat, where I was to spend the night. The excitement in the Ministry of Munitions during this day and at home may well be imagined. . . .

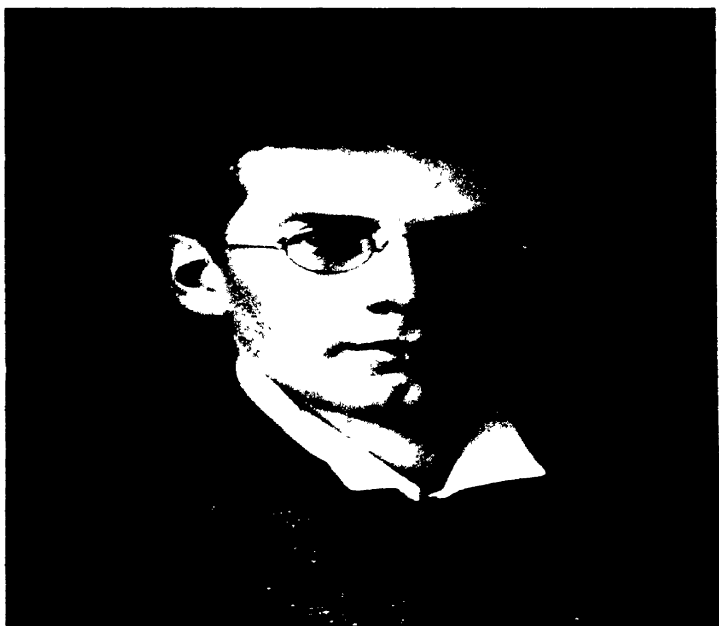
" . . . Montagu has been a most unhappy spectacle during these days and was obviously in a very difficult position. He felt bound, of course, to Asquith, who has done everything for him during his political life, but he was keen, happy and interested in his work, and doing it well, and of course did not want to drop it. He did not know which way to turn, but could not bring himself to leave Asquith and his colleagues. . . .

" . . . He had many talks with Kellaway and myself during Monday and Tuesday and with me on Wednesday evening again before the meeting at the War Office. He was very disappointed and in a wretched frame of mind. . . . One can understand his personal affection and feeling of indebtedness to Mr. Asquith, and his respect, which I think is sincere, for L.G. and his regard for his office, which he has filled very well indeed. I could not tell him of the conferences I had been asked to attend in a confidential capacity, and could only urge, in as friendly and sympathetic a way as possible, that he must decide finally one way or another for himself, and that the hours were slipping by. . . ."

There is no harm in recalling the substance of a little entertaining discussion of the Wednesday evening which led to interesting results the following day. Various eminent persons had been suggested for the Board of Education, and I hazarded an expression of hope that, for a change, it might be serviceable to appoint someone to the Board who knew something about Education. They thought it was a good idea. As I had made it, they saddled me with the responsibility of bringing forward alternative names the following day. Later on I found another guest (Prof. Tom Jones) at Davies' flat, and, as he was cognisant of these matters, I began to pick his brains as to suitable men in the educational world. We finally concentrated on two names, and I decided to recommend Fisher as the first of the two on the following day.

December 9 (continued).

" . . . L.G. and J. H. Thomas came to breakfast with us on Thursday morning. We all felt that it would be useful if Thomas were to be in the administration somewhere, but nothing definite could be arranged, as L.G. was to meet the Labour Party formally later on in the day. . . . We had a short meeting at the War Office again—the same five as above—shortly after ten o'clock. The Fisher suggestion was received with acclamation. Talbot knew him and spoke in high terms of him, and it was decided then and there that he should be asked. . . . Davies was soon through to Sheffield on the telephone, and in a few minutes it had been arranged that Fisher should catch the first train up to London. He came into the War Office in the evening, saw L.G., and was formally appointed President of the Board of Education.



THE RT HON. F. H. KILLAWAY



SIR W. GEORGE JONES *Photo by Vandy*

"A good many more of the appointments were made that day with a like despatch. I, myself, was responsible for suggesting Stanley for the Board of Trade, and did it with a wry face, for he was most valuable to us at Munitions, and, with the big aeroplane programme now saddled on us, it was a puzzle to know how he would be replaced. But they all agreed that he was to be asked—which he was with the same promptitude as the rest. We made another sacrifice at Munitions also, for I suggested Lever to help Bonar at the Treasury, and he jumped at it. This will mean another big gap in the hierarchy, but the Costings System is now well established, and John Mann is a tower of strength. . . .

" . . . L.G.'s meeting with the Labour Party was, on the whole, very friendly, and they adjourned to consider whether they should participate or not. Later on they decided to do so, Henderson to be in the War Council. Hodge, Barnes, Macnamara, Brace, Clyde, Cawley and others are to be invited, and Finlay is to be offered the Lord Chancellorship; also Devonport, Food; Maclay, Shipping; and Prothero, Agriculture.

"Accounts which the scouts brought in were increasingly encouraging. It was evident that as the possibility of L.G. being really able to form a Government dawned on some of his opponents, the feeling of want of confidence in the issue rapidly waned. I saw several Members of Parliament during the day, including Lord Illingworth, Sir Frederick Cawley, Sir Ivor Herbert, and others. . . .

"Later on in the evening we had another short sitting at the War Office, and L.G. had to go to the Palace. About half an hour afterwards, Davies told me that he had returned, and had reported to the King his ability to form a Government and had been appointed Prime Minister. I went into the room and was the first Member of Parliament to shake hands with him as Prime Minister, and heartily congratulated him. In one of his impetuous moods he suggested that we should go and dine at the National Liberal Club, and challenged me to accompany him! I said that I was willing enough to do so if he thought it well to go. But——? Instead of this he invited me to join him at his first ministerial dinner in his room at the War Office. I wonder how many British Prime Ministers have celebrated their appointment to office in the frugal way that we did. There was not much time to spare for meals. After a bit his messenger appeared and laid a cloth on the end of the big table and produced a cold chicken and a boiled ham out of some paper, and went back with a friendly grin, assuring us that he was hoping to do better in a few minutes. This would have served excellently, but soon he returned with two basins of soup and a piece of fish. We were satisfied with the soup and the fish, and the chicken went untouched. He did, however, produce a bottle of champagne, and, abstemious men as we both were, the occasion demanded a toast, in which J. T. Davies joined us. . . .

"This meal, however, was interrupted by a continuance of Cabinet-making, for it had been decided during the afternoon to test whether all the former Liberal Cabinet Ministers were determined to stand out, and Samuel was sent for to be invited to continue at the Home Office—the precise form of the offer to Cave being deferred until after this interview. Samuel arrived nearly at the conclusion of the meal, and as L.G. wanted to be alone with him, I hurried out with the remains of it into the next room and finished it there. . . .

"L.G. soon sent for me. Samuel had declined point-blank, first on the ground of his loyalty to Asquith, and, second, because he did not consider

that L.G.'s Government had any promise of stability. He was in a superior mood. . . . L.G. told me that he suggested that perhaps Samuel would be better able to form an opinion as to the likelihood of his administration being stable when he knew how it was composed. Samuel surmised that neither Balfour nor Walter Long would accept office, and was a good deal taken back when L.G. informed him that both had already done so.

"A meeting of Members of Parliament friendly to us was held in Cawley's room in the House of Commons in the afternoon. There was some excitement about a meeting of the Liberal Party which had been called at the Reform Club on Friday. The suggestion had got about that there was to be a resolution passed not only swearing loyalty to Asquith, as leader of the Liberal Party, but suggesting that those who supported L.G. were to be cut off from it. Our Group therefore let the Whips know that if there were anything of that kind it would meet with the most vehement opposition. The result was that the two resolutions which had been suggested were resolved into one containing a promise of support to L.G.'s Government, if he should be able to form one. . . .

" . . . A great part of Friday morning was occupied with a meeting of Colonial representatives, High Commissioners and others on the subject of setting up a system of Committees to advise on priority in the Dominions—India, etc.

"I went across to the War Office just before lunch and found that great progress was being made, no refusals were being experienced; Illingworth, Gordon Hewart and others were willing enough to come in, and were enthusiastic in support of L.G.'s efforts.

"I heard from Kellaway that there was a pretty considerable stampede on to L.G.'s side at the meeting at the Reform Club, showing an evident determination on the part of most to support L.G.'s Government.

"L.G. contemplated in the evening publishing, without comment, the letter of the Prime Minister received on Monday morning which showed that he had accepted the arrangement; but eventually decided that nothing should be done in the matter, which I am sure was right.

"It is not necessary to detail all the shifts and changes that went on. A great many of the junior appointments and many details were managed by Bonar Law and myself, reporting to Lloyd George from time to time. The appointment to the Local Government Board for one reason or another was one of the most difficult to fill. . . . It was necessary to have a strong administrator . . . for we needed a strong live organisation at the L.G.B. and a strong staff. Finally, I suggested Rhondda. I felt that this would be the kind of job he would do well, as he had done magnificently in Canada, so it was decided to offer it to him. This was done later on in the day, and he accepted it. . . .

"L.G. told me that the King had approved of the first list of appointments, including my own, and had asked what sort of a fellow I was. L.G. had exhorted His Majesty to wait and see, but had assured him that I was not without wits.

"We decided to form a Labour Department, and put into it as much of the Labour Section of the Ministry of Munitions as was practicable, together with the Labour Sections of the Board of Trade, and Hodge is to be Minister of Labour. They will no doubt continue to be housed at Whitehall Gardens somewhere, and we shall have to discuss the working arrangements. If Hodge does as well as Minister as he has done with us at Munitions in helping



THE KING'S VISIT TO MUNITION WORKS AT NOTTINGHAM, DECEMBER 15, 1916.
(By permission of Campbell and Co.)

us with workers in the steel trade and with cutting short disputes, he ought to do very well. He has been a tower of strength on a good many occasions, and plays up splendidly. He is the best example I know of a trades-union having the sense to give a man security of tenure and a decent salary. The long and short of it is, that his union is about the best paid of any of the skilled unions and more free from strikes and stoppages, I believe, than any.

"Owing to the delay in filling up the L.G.B. and one or two other appointments, the Council with the King was postponed until Monday.

"The other evening I had a talk with Walter Isaac, of the London Liberal Federation, who had summoned a meeting of the Executive, of which, of course, I am a member, by telegram. I wanted to know whether there was any question of those supporting L.G. being deprived of the party machines, such as they were. I said if that were so we should at once take our coats off and make a machine for ourselves. He assured me at once that whatever else the Federation might do, nothing would give them greater joy than to back up me in my election, which will have to take place, I am sorry to say—let us hope not to be contested.

"Later on in the evening, when I got home, Gulland rang me up, very excited, protesting that the Whips would help those who were supporting L.G. as well as those who were not. I am afraid I expressed surprise as well as gratitude at this information. The fact is, during the past week, the Whips have used any and every effort possible to discredit L.G. and my much less important self, and have taken all possible steps to prevent Members rallying to him. They now, of course, find themselves left behind.

"It has been a great week for me. I feel proud to have suggested Cave for the Home Office, and Rhondda and Stanley, and to have had a hand in helping to rally a good many of the Liberals. Gordon Hewart ought to be a good appointment. Henderson, Hodge and Barnes are a strong trio from Labour, but there are a good many appointments still to be filled."

Thursday, December 14.

"I think the staff at Munitions is genuinely pleased at my being appointed. L.G. at first wanted me to be Chief Whip, but I should hate the job, and I am quite sure I could never manage the horrible touting about honours. It is bad enough in a department; Heaven knows what it is like in a Chief Whip's office! I am glad to have got Kellaway as an Under-Secretary here. He has had a fine training for the last two years, especially in Labour matters, and will be a great source of strength with them. I selected Worthington Evans, but they rather wanted me to have . . . but Talbot took my view of the case. Glyn Jones, who has helped us nobly these days, will be my Private P. Secretary in place of Kellaway, I hope.

"At the Palace on Monday, Curzon rather wanted to go back on the arrangement about aeroplanes, but there is no case. I sent a note across as soon as I got back to L.G. upon the point, and received firm assurances from him that he would stick to the previous decision.

"As the King was shaking hands with us when we were leaving, to my surprise he began a conversation with me telling me that he hoped to go down to inspect Chilwell and the Shell Factory at Nottingham on Friday, and saying that if I could spare the time to accompany him he would be glad of my company, so that I must look forward to spending to-morrow (Friday) in his company. He has the knack of putting one at one's ease, so I anticipate no difficulty in the matter. . . .

" . . . On Tuesday, Gulland played up and told me that he was writing to all those Liberals who needed re-election, promising full support. I had a

long talk, too, with Rhondda on Tuesday, and to my joy he is very keen on health matters, and wants to receive some enlightenment on our long-cherished project of a Health Ministry.

"Primrose with great reluctance has had to accept the job of Chief Whip. He hates the prospect, but is willing anyhow to take it for a time. I am sure he will escape for active service at the first opportunity. . . ."

There are all manner of scattered references in my notes to incidents and men connected with the formation of the new Government, but from December 9 onwards it is mainly occupied with munitions conferences, shell and fuse supplies, railway material orders, aeroplane engine manufacture and a host of other pressing topics. It was no time for celebration, and I believe that each man of us in his new office was hard at work on his job within a few hours of his appointment.

Such was the rush of events that I think scarcely any of us recognised the profound change that had come about. Lloyd George himself, from our first modest dinner at the War Office, scarcely realised, I think, that he had attained the highest position in the British Empire.

The suggestions of intrigue and scheming which have formed so great a part of many comments on what took place during those days of crisis do not receive any support in my notes, which are thoroughly faithful. I did not know what took place in the conferences between Lloyd George and the Conservatives during the days preceding the break-up of Asquith's Government, but so far as I ever knew there was no question of intrigue or spite about it. It was the culmination of a well-grounded dissatisfaction with the handling of affairs. I am convinced that nine out of ten of the Liberals who supported Lloyd George—and I was in touch practically with them all—had no other thought in their minds except that they were likely to get a more vigorous administration. Apart from the disappointments over Mesopotamia, Roumania and other issues that have come into these records, every thinking man was profoundly uneasy about our own future as to supplies at home, for the submarine menace was growing daily and the stores of food at home were perilously low. I do not believe that one man out of twenty was actuated by personal motives against Asquith. A patriotic keenness to get, if possible, a body of men who would handle things with more decision and promptitude was their governing motive. A lot of fresh blood had been brought in, and there was a vigour and zeal for efficiency in Government circles that was, I believe, unprecedented. We none of us knew what the future had in store. There was no rejoicing. There was much anxiety; and, above all, a resolution to do better if we could.

Appendix No. 1

THE COMMITTEE ON TUBERCULOSIS ¹

Appointed February 22, 1912

TERMS OF REFERENCE

To report at an early date upon the considerations of general policy in respect of the problems of tuberculosis in the United Kingdom, in its preventive, curative and other aspects, which should guide the Government and local bodies in making or aiding provision for the treatment of tuberculosis in sanatoria or other institutions or otherwise.

MEMBERS

Waldorf Astor, Esq., M.P. (Chairman).
Christopher Addison, Esq., M.P., M.D.
N. D. Bardswell, Esq., M.D.
David Davies, Esq., M.P.
A. Mearns Fraser, Esq., M.D.
Arthur Latham, Esq., M.D.
W. Leslie Mackenzie, Esq., LL.D., M.D.
John C. McVail, Esq., LL.D., M.D.
W. J. Maguire, Esq., M.D.
Sir George Newman, M.D.
Arthur Newsholme, Esq., C.B., M.D.
James Niven, Esq., LL.D., M.B.
Marcus Paterson, Esq., M.D.
Sir R. W. Philip, M.D.
H. Meredith Richards, Esq., M.D.
T. J. Stafford, Esq., C.B., F.R.C.S.I.
Miss Jane Walker, M.D.
J. Smith Whitaker, Esq.
Sir F. J. Willis.²
Sir Stewart Stockman, M.R.C.V.S.
Arthur Henderson, Esq., M.P., succeeded by
Albert Smith, Esq., M.P.³
O. B. Clarke, Esq., *Secretary*.

¹ Referred to in Chapter I, p. 25.

² At first Secretary—then Member.

³ Added later in place of Mr. Henderson.

Appendix No. 2

PROPOSALS FOR A NATIONAL SCHEME OF ADVANCED INSTRUCTION AND RESEARCH IN SCIENCE, TECHNOLOGY AND COMMERCE ¹

From the Memorandum made use of by Mr. Pease in introducing the Proposals in the House of Commons, May 13, 1915.

1. Many of our industries have suffered during the war through our inability to produce at home certain articles and materials required in trade processes, the manufacture of which has become localised in Germany through the superior skill and energy which the Germans have applied to the organisation of scientific research and its application to industry and manufacture. On the conclusion of peace, the Germans will devote the same power of scientific work and organisation but with renewed energy to the task of capturing our markets, both at home and abroad. It is unnecessary to emphasise the grave danger, possibly approaching economic ruin, which will be incurred if the Germans get their own way and we have to face fresh and embittered competition without enlarged scientific resources. The advantages, sometimes amounting to a practical monopoly, which the Germans have secured over our manufacturers in dyes, drugs, scientific glass-making, X-ray instruments, photographic paper, and many other branches of industry, have been mainly due to the scarcity of scientific research work in this country and the small use made of it by industrial firms. In the United Kingdom, for instance, there are only 1,500 chemists, including analysts, employed in the whole of our industries. In Germany the four chief firms in the one industry of colour-work alone employ 1,000 research chemists. A similar state of affairs exists in many of our industries, and it appears to me to be incontrovertible that if we are to maintain our industrial position we must, as a nation, aim at such a development of scientific, technological, and commercial education and research as will place us in a position to compete successfully with the most highly organised of our rivals.

2. The problem is twofold. We have not merely to make the best use of the scientific men we now possess, but to provide a fuller supply in the future. The deficiency in the supply is mainly due to the slight prospect which applied science offers of a useful and remunerative career, and this in turn is due to the fact that the leaders of industry do not

¹ Referred to in Chapter II, p. 51.

appreciate the service which science might render to them, partly because the training in our universities has hitherto been directed to the requirements of examinations rather than to the application of knowledge to industry, and partly because the facilities for post-graduate research into problems of direct concern to industry have hitherto been very inadequate. Further provision for post-graduate work is therefore essential, but we have at the same time to build from the foundations educational steps by which the ablest boys from elementary schools may rise through the secondary schools or technical colleges up to the universities. The pick of those who have completed their university course will become research students or teachers (and in science fruitful teaching and research go hand in hand), and will form a body from which the scientific directors of industry will be recruited.

3. During the last few weeks, Dr. Addison and my staff have been giving very careful consideration to the details of the problem, and as a result of their investigation, in consultation with experts, the following scheme is recommended. The scheme is framed on the assumption that it is desirable to avoid controversy. For that reason the elementary school system is left untouched. Any reform here would involve legislation of a highly controversial nature and also very great expense.

4. The first part of our scheme aims at sifting out and assisting those pupils whose capacity justifies public expenditure on their continued training—

- (1) Those who are in secondary schools.
- (2) Those who are qualified to receive whole-time instruction in higher technical institutes or universities.
- (3) Those who, on the completion of their university course, are fit to receive scholarships or fellowships in industrial research.

At the same time the proposals provide for increased grants to the several kinds of schools or colleges to enable them to deal with increasing efficiency with the larger number of pupils who may be expected to attend them.

MONEY REQUIRED FOR 1916-17.

5. (a) *Secondary Schools.*

Our secondary school system is already fairly democratic. Sixty-four per cent. of the pupils in grant-aided secondary schools come from public elementary schools. One-half of these have free places, and one elementary school child out of twenty-three goes forward into the secondary schools. The principal defects, for the remedy of which money is required, are—

- (i) The short school life.
- (ii) The inadequacy of the schools to give advanced training to older pupils.
- (iii) The multiplicity of examinations.
- (i) Large numbers of our best children leave our secondary schools at too early an age, owing to the unwillingness or inability of parents to make a further sacrifice for their education at a time when they can

commence to earn wages or small salaries in trade or business. This tendency reacts on the schools which find themselves unable to provide adequate education for the older children. It is proposed, therefore, to establish a scheme of bursaries to enable children from families of moderate means to remain at school up to the age, say, of 17 or 18.

(ii) At the same time, I contemplate giving increased assistance to those secondary schools which make efficient provision for the education of children above the age of 18.

In 1916-17 these proposals for the expansion of secondary education will cost £26,000.

(iii) If we are to make progress with the purposes indicated in (1) and (2) we must get rid of the present multiplicity of outside examinations, with all the professional and artificial cramming they entail, and substitute for them a national school examination, held in the school, capable of use as a standard examination for admission to the universities and professions. The machinery for this object has been the subject of long and careful consideration by the Consultative Committee and Staff of the Board in consultation with schools and bodies concerned. The cost in 1917-18 is estimated at £50,000.

(b) *Technical Schools.*

The Treasury have already assented in principle to the expenditure of £80,000 in 1916-17, to be distributed on an improved grant system, for the encouragement of this branch of our work. A further £20,000 for the same year is required to assist the provision of specialised and better equipped courses of instruction, which will be of direct value to the manufacturer, and would involve the creation of Advisory Committees representing local trade interests.

(c) *Universities and Higher Technical Institutes : Whole Time.*

(i) *Scholarships.* All the arguments for lengthening the school life of the best school-children apply to extending the further education of the best pupils in technical classes. The economic difficulty is here even more strongly felt, and State aid is therefore required on a more generous scale. It is proposed that in the year 1916-17, £11,000 should be expended on scholarships tenable at universities and higher technical institutes by 120 whole-time students, rising afterwards to 300. The scholarships, which would be of an average value of £90, would be mainly distributed between engineering, building, and woodwork trades, chemical industries, mining, textiles, commercial and pure science subjects.

It is also proposed that £15,000 should be expended in scholarships of the value of £90, tenable at similar institutions by carefully selected students from secondary schools.

(ii) *Grant in aid of Fees.* In addition to the financial aid given by way of scholarships, the proposals include a uniform degree course fee of £10 a year in accordance with the recommendations of Lord Haldane's Commission. To make good the loss to the universities we should require an additional grant of £66,000 in 1916-17.

(iii) *Grant for Maintenance and Equipment.* At the expiry of the present quinquennium in 1916, an additional grant of £100,000 is pro-

posed in order to enable the universities in receipt of grant to improve their staff and equipment and provide facilities for research. In addition to the direct advantages to industry, this will give men who have hitherto turned to other callings a reasonable prospect of a career within the university itself.

The scheme of educational development does not profess to cover the whole field, but so far as it goes it may be regarded as a complete building in itself, but planned for extension. Wings and annexes can be subsequently added to it when we come to deal with the reconstruction of the University of London, pensions for secondary school teachers, and the more effective linking up of our elementary school system, particularly in rural areas, with secondary schools.

6. The Second Part of the scheme is directed to the promotion of research work into industrial and commercial problems. For this purpose, I am asking for sanction to spend in 1916-17 the sum of £90,000, distributed as follows—

(i) £20,000 of this is required to provide at first for 100 post-graduate research scholarships and research fellowships in science, technology, commerce, and economics for the best men from our universities and the higher technical institutions. These would be tenable for one year subject to renewal. It is suggested that the graduates should be nominated by the universities on a similar system to that which has been worked by the Carnegie Fund in Scotland with admirable results.

(ii) £40,000 will be required to aid promising lines of research in engineering, electrical, chemical, textile and other work where there are obviously many processes in which research may be promoted with great advantage, and invaluable indications have already been afforded as to promising lines of research. A series of grouped researches would be included in this branch of the scheme.

(iii) £30,000 will be required to encourage the formation of specialised departments in association with existing universities or higher technological institutions, or independently.

7. Special attention has been given to the question of the administration of this part of the scheme, the object of which is to bring science to bear on industry, and industry to make use of science. Having regard to the facts—

(a) That the great bulk of such research will be done in or in connection with universities and colleges which are already aided by the Board.

(b) That research involving co-operation between teachers and students is an essential element of systematic higher education and the best test of its efficiency.

(c) That, apart from its utilitarian object, State-aided research must aim at increasing the common stock of knowledge, and its results must be made readily available for teachers and students.

I suggest that the Minister of Education should be responsible to Parliament for this work. At the same time, the co-operation of the principal trades and industries is essential to success, and an organisation must be provided which can secure the effective and systematic co-

operation of researchers in the same field of work. I therefore recommend the formation of a Central Council of Commercial and Industrial Research, responsible to the Minister of Education. The Council should be as small as possible. It should not represent interests, but be composed of scientists, traders, and other persons selected because of their personal fitness. This Council should have a large panel of advisers representing various industries, scientific and professional organisations, etc., selected members of which should be called upon for advice as required. In order to prevent overlapping and to promote co-operation, I suggest that the different Government Departments with research funds at their disposal should appoint representatives, who will be entitled as assessors to share in the deliberations of the Council. The Board of Trade should clearly be asked to participate, especially as measures may become necessary to secure for the public advantages resulting from State-aided research.

8. The work of the Central Council of Research would fall chiefly under these three heads—

(i) They would award the post-graduate and research scholarships and would approve the subjects in which, and conditions under which, the researches should be undertaken, whether in laboratories, workshops, or other places.

(ii) They would advise on and assist the individual or grouped researches mentioned in paragraph 6 (ii).

(iii) They would also advise on and assist the provision and maintenance of specialised departments mentioned in paragraph 6 (iii).

9. I believe that a scheme on these lines, by bringing Science and Industry into immediate contact, would very soon create a demand for a larger supply of trained scientists for industry. To secure permanence and continuity in the carrying out of these purposes, I suggest that the Board of Education should have placed at its disposal, by Act of Parliament, the sum of £1,000,000 for a period of five years to be expended on the advice of the Council. A similar principle has been adopted in the case of the Development Fund, and would, I believe, greatly conduce to the success of this part of the scheme.

10. The total expenditure on the above scheme would be, in bringing forward students from the secondary and technical schools through the universities, £318,000, with a further £90,000 in connection with industrial research work, or, with an equivalent grant for Scotland and Ireland, say £500,000 in all, in respect of the year 1916-17. This State help would, no doubt, increase in subsequent years.

If the general outlines of this scheme are approved, there should be a supplementary estimate for the year 1915-16 not exceeding £25,000 to enable the machinery to be started in the current year, so that the full scheme might commence without any undue delay in the year 1916-17.

As time is important, and as much detailed preliminary work will be involved and many authorities will have to be consulted, authority is asked to proceed on these lines without delay.

J. A. P.

SUMMARY

	1916-17
I. IMPROVEMENTS ON EXISTING LINES—	
<i>Secondary Schools—</i>	£
1. Bursaries	10,000
2. Grants	16,000
3. Examinations	Nil ¹
<i>Technical Schools</i>	100,000 ²
<i>Universities—</i>	
1. Scholarships	26,000
2. Grants in aid of fees	66,000
3. Maintenance grants	100,000
Total for 1916-17	£318,000
II. RESEARCH—	
New work, £1,000,000 for 5 years, of which	
£25,000 will be required in 1915-16 and in	
1916-17	90,000
	<u>£408,000</u>
Making, with equivalent grants for Scotland and Ire-	
land, an approximate total of, say	£500,000

¹ The expenditure on examinations will not mature until 1917-18.

² Of which £80,000 has been agreed to in principle.

Appendix No. 3

GUN AND AMMUNITION STATISTICS¹

GUNS

Promises for and deliveries on June 1, 1915, were as follows—

	Promised.	Delivered.
18-pounder	744	604
4.5" howitzer	434	126
60-pounder	78	42
6" howitzer	Nil	Nil
8" "	23	23
9.2" "	16	16
12" "	17	5

The heavy guns in the field, at the time of the first Return, were—

6" guns	8
6" howitzers	48
8" "	6
9.2" "	16

Percentage of existing guns for which ammunition issued was sufficient.² (Precise figures for the seven weeks ending July 31)—

Guns.	Percentage.
18-pounder	55 per cent.
15 "	17 "
13 "	43 "
60 "	62 "
4.7"	33 "
4.5"	40 "
5"	40 "
6" gun	100 "
6" howitzer	63 "
8" "	45 "
9.2" "	40 "

¹ Referred to in Chapter IV, p. 69.

² This includes the ammunition issued with units as part of the current supply.

Supplies on the lines of communication for the various types of guns—

Guns.	Days.
18-pounder	12·5
15 "	0·6
13 "	4
60 "	22
4·7"	2
4·5" howitzer	4·5
5" "	Nil
6" gun	14·1
6" howitzer	7
8" "	6
9·2" "	4·5

EXAMPLES OF ARREARS IN DELIVERIES

(1) One firm had undertaken to begin delivery of 4·5" howitzer high-explosive shells in December, 1914, but up to May 1, 1915, had delivered only 2,225, and were 47,475 in arrear.

(2) On an 18-pounder shrapnel order for which delivery was to begin at the end of February, none had been delivered up to May 1, and they were 131,785 in arrear.

(3) Another equally experienced firm had accepted orders for 4·7" shells, deliveries to begin on one order in December, 1914, and on the other in January, 1915, but in neither case had a single delivery been made up to May 1.

(4) The same firm had an 18-pounder shrapnel order for which delivery was to begin in March, 1915, but up to date none had been delivered, and they were 232,500 in arrear.

Appendix No. 4

CHIEF OFFICERS IN THE STEEL DEPARTMENT ¹

Sir John Hunter, Director-General.

T. W. MacLellan

Col. W. Charles Wright, C.B. } Deputy Directors.

Mr. James Peach, Shell Steel.

Mr. E. L. Herbert, Overseas Shell Steel.

Prof. F. W. Harbord, Metallurgist.

Mr. John Hall, Commercial Steel.

Mr. B. Walmsley, Pig Iron.

Mr. F. L. MacLeod

Capt. R. Wallis-Jones } Iron

Dr. F. H. Hatch

Mr. A. K.

Mr. T. McAlpine } Home Ore and Limestone Production.

Mr. C. G. Atha

Mr. J. D. Stitt, Scrap Steel.

Mr. Frank Merricks, Mining Engineering.

¹ Referred to in Chapter X, p. 143.

Appendix No. 5

**MATERIALS REQUIRED IN ONE STAGE OR ANOTHER FOR THE
MANUFACTURE OF A COMPLETE ROUND OF 18-POUNDER
AMMUNITION AND OBTAINABLE EITHER FROM HOME
SOURCES OR FROM THE COUNTRIES NAMED ¹**

Aluminium	America France Norway
Acetone	America Canada
Ammonium Nitrate	Norway America
Antimony	China
Bauxite	Greenland
Beans and Seeds for Oil	Africa India Ceylon
Cryolite	Denmark
Calcium Carbide	Norway Canada
Copper	Spain America Africa Australia Japan
Cotton	Egypt
Corundum	Madagascar
Carborundum	America
Emery Stone	France
Iron Ore	Sweden Spain Norway
Lead	Greece America Spain China Australia Burma

¹ Referred to in Chapter X, p. 149.

Appendix No. 6

EXPLOSIVES SUPPLY DEPARTMENT ¹

LIST OF CHEMICAL ADVISERS

Dr. R. C. Farmer, F.R.S.
Captain Egerton.
Dr. Spielman.
Professor A. Green, F.R.S.
Dr. J. C. Cain.
Professor Steel.
Lt.-Col. J. H. Hall.
Mr. H. A. Humphrey.
Professor J. Thorpe, F.R.S.
Dr. C. Weizman.
Mr. W. Cullen.
Mr. W. McNab.
Mr. J. Ruymbeke.
Major Waring.

¹ Referred to in Chapter XI, p. 158.

Appendix No. 7

A NOTE ON REASONS WHY IT WAS DECIDED IN MARCH, 1916, THAT THE MINISTRY OF MUNITIONS MUST CONTINUE TO DEAL WITH LABOUR QUESTIONS ¹

1. The dilution of labour involved the examination of machinery, the speeding up of manufacturing processes, subdivision of shop-work, and other manufacturing details that could not be separated from the work of supply.

2. The mobile labour teams, such as War Munion Volunteers, Soldiers released from the Colours, Army Reserve Munion Workers, and others, had to be used by us as special squads, and therefore we had to retain control over them.

3. Similarly the administration of the continual modifications in the schedules of protected industries so as to release or safeguard workers was one which inevitably devolved upon our own workshop and other staffs.

4. Our men only could formulate the labour requirements and classify them and devise schemes of allocation.

5. We were directly responsible, as managers, for a large number of factories and could not divest ourselves of the functions of management.

6. The vast majority of disputes were settled on the spot, and had it not been for our local men being in daily touch with the manufacturers and workshops, innumerable delays and stoppages would have occurred.

7. In the same way matters affecting welfare, canteens, hours, holidays, and other kindred personal questions were mixed up with questions of workshop management, output needs and many others which could only be dealt with by people who were in touch with the different activities of the Ministry.

¹ Referred to in Chapter XIII, p. 190.

Appendix No. 8

CLYDE INDUSTRIAL DISPUTE

STATEMENT IN PARLIAMENT BY DR. ADDISON, MARCH 28, 1916 ¹

Mr. MacCallum Scott (by Private Notice) asked the Minister of Munitions whether he is in a position to make any statement about the industrial situation on the Clyde?

ADDISON: "After consultation with my right hon. friend, who is leading the House, it is felt that in view of the gravity of the crisis which has arisen on the Clyde, the House will permit a longer statement than is usual in answer to a question.

"The House will be aware that in January, 1916, in order to secure the necessary supply of labour by means of the policy of dilution, the Minister of Munitions appointed three Commissioners to represent him on the Clyde. Their proceedings, which have been in direct accordance with the Treasury agreement, have been, on the whole, conspicuously successful, and they have secured the confidence both of the local trade-union leaders and of the employers.

"In the course of the past week, however, a number of strikes have been organised in some of the most important munition works in the Clyde district, and energetic attempts to extend them are being made at this moment. At different times strikes have been brought about, sometimes on the most trivial grounds, by a self appointed body known as the Clyde Workers' Committee. This Committee, which, I am informed, was originally styled the Clyde Labour Withdrawal Committee, has repudiated any connection with, or allegiance to, established trade unions, and decided about a fortnight ago to embark on a policy of holding up the production of the most important munitions of war in the Clyde district, with the object, I am informed, of compelling the Government to repeal the Military Service Act and the Munitions of War Act, and to withdraw all limitations upon increases of wages and strikes, and all forms of Government control.

"The present series of strikes commenced on the 17th of March, when one of the chief members of this Committee insisted that he should be entitled during working hours, without the permission of the management, to leave his work in his own department and go into any other department of the works for the purpose of investigating what was being

¹ Referred to in Chapter XIII, p. 192.

done with unskilled labour, interviewing the women introduced, and examining into their proficiency, rate of wages, and other matters. The management, whilst offering to afford the man in question all reasonable facilities for this purpose, felt themselves unable to accede to his request, and referred the matter to the Clyde Commissioners. The man in question, however, and his associates, in breach of their own agreement declined to place the matter before the Clyde Commissioners, and succeeded in bringing out about 1,000 in these works.

"From that time the series of strikes appears to have proceeded upon a systematic and sinister plan. The method adopted has been to bring out on strike workmen engaged upon the production of a particular heavy gun and gun-mountings, for which we are receiving the most urgent demands. The Committee visited in succession works which are making parts of these guns. In many places they have been unsuccessful, but they have succeeded in bringing out a number of men in five different important works engaged upon the manufacture of portions of these guns. The Executive Committee of the Amalgamated Society of Engineers, on the matter being reported to them by their local officers, immediately issued a statement repudiating the strike, forbidding the payment of strike benefit, and calling on the men to return to work.

"These efforts were unfortunately unsuccessful, and on Friday last it was clear that a situation had arisen which called for immediate action by the Ministry. My right hon. friend requested the military authorities to remove under Section 14 of the Defence of the Realm Regulations six of the ringleaders, who were found, with others, to be contemplating a further extension of their operations. The movement which is now in progress has no connection whatever with any industrial grievance. It is repudiated by the official trade union, and is plainly being deliberately organised and directed to hold up certain particular munitions of war of which the Army in the field has the most urgent need. Loyal workers on various pretexts are being persuaded and intimidated into participating in this movement. The Ministry considers that the attention of the workers, as well as of the public, should be called to the character of the movement now in progress. They are satisfied that they have the support of the vast majority of munition workers on the Clyde, who are opposed to the dangerous and disloyal action of the Clyde Workers' Committee, and they have the support also of the trade unions, against whose existence and authority the operations of this organisation are directed as much as against the Government.

"The Ministry of Munitions have received loyal assistance and co-operation from the Executive Committee of the Amalgamated Society of Engineers and from their local officials.

"The Government are confident that they may rely on the support of Parliament and of the Nation if it becomes necessary to put in force the full powers vested in the Executive under the Defence of the Realm Acts, in order to safeguard and maintain the full unobstructed production of every kind of war material which the country needs for the successful prosecution of the war."

Appendix No. 9

PARTS AND PROCESSES INVOLVED IN THE MANUFACTURE OF A ROUND OF 18-POUNDER AMMUNITION ¹

The Primer. This small component, fitted at the base of the cartridge case, is the agent by which the discharge of the cartridge is secured.

There are 7 different metal components in a primer, and 6 additional separate articles are required to complete its filling.

Thirty-three different gauges are entailed in the manufacture of a primer.

Cartridge Cases. Manufactured from brass consisting of 70 per cent. copper and 30 per cent. zinc.

After the strips of brass from which the case is made have been annealed and pickled, 30 separate operations are required involving the use of 11 different gauges.

Shell Cases. Made either of forged or rolled steel. The case goes through 29 different operations involving the use of 39 workshop and 21 inspection gauges.

The plant required for the production of 5,000 cases per week during 120 hours, apart from the gauges, are 96 lathes, 1 bench, 3 vices, 2 presses, 3 drilling machines and 2 typing machines.

Gauges. The tolerance allowed on a gauge was less than 1/1,000 inch, and most of the gauges required to be accurate to 3/10,000.

A time fuse required 160 gauges; a percussion fuse 99, and so on.

There were in all at the time of full activity about 7,000 different varieties of inspection gauges in use, the output being several thousands per week.

Each gauge was tested at the National Physical Laboratory.

Filling. The filling of the fuse is the most complicated part of the filling of the whole round.

The fuse itself is filled with a special detonating mixture, passed on from this to a larger detonator contained in a thick steel tube, known as the gaine, from which the explosion is transmitted through special explosive pellets to the general explosive mixture in the body of the shell. All these require separate fillings.

¹ Referred to in Chapter XVI, p. 231.

Appendix No. 10

SUGGESTED SCHEME FOR THE REGISTRATION AND VOTING OF SOLDIERS ¹

MR. LLOYD GEORGE

A. *Preparation of the Register.*

(1) The Officer in charge of Records will prepare lists of the men according to the counties and towns according to their home addresses. He will send the lists, when so prepared, to the Clerks of County Councils or Town Clerks.

(2) The Clerks of the County or Town Councils will sort the names into Parliamentary Divisions, prepare lists of soldiers arranged in Parliamentary Divisions, and return the lists so prepared to the Officer in charge of Records.

(3) The Officer in charge of Records, having received the lists sorted in Parliamentary Divisions, will then arrange the complete list of the men in the Units arranged for Parliamentary Divisions.

B. *Preparation for the Election.*

(1) The Local Government Board will prepare a Government list of Parliamentary candidates duly nominated, together with such titles as Conservative, Liberal, Labour, etc., as are the accepted titles of the candidates. The lists will contain no other matter relating to any candidate.

(2) The Local Government Board will also supply to the Officer in charge of Records such a number of Ballot papers as the Officer in charge of Records has required to be sent.

(3) The Local Government Board will have filled in upon the Ballot forms, according to the numbers requisitioned, the name of the constituency and the names of the candidates, alphabetically arranged, according to the list.

(4) The Officer in charge of Records will forward to the Officers commanding Units the Ballot papers belonging to his Unit, together with the list showing the Parliamentary distribution of the men in the Unit.

(5) Parliamentary candidates will be entitled to print an Election Address of a limited number of words, and shall supply such numbers to the Returning Officer of their district as he shall be instructed by the Local Government Board to ask for—such number to correspond with the number of soldiers on the Military List for that constituency.

¹ Referred to in Chapter XVII, p. 254.

(6) The Candidates' Election Addresses will be forwarded by the Returning Officer to the Officer in charge of Records.

(7) The Officer in charge of Records, in forwarding the Ballot papers to the Officer commanding Units, will accompany them with an equivalent number of Election Addresses as required by the men belonging to the constituency represented.

C. Conduct of the Election.

(1) The Officer in command of the Unit will be responsible for seeing that each soldier in his Command is supplied with the appropriate Ballot paper and candidate's Election Address. As a soldier is supplied with a Ballot paper and Election Address, his name will be struck off the list.

(2) The Ballot paper will have upon the reverse of it, when folded up, the address of the Returning Officer of the constituency to which the soldier belongs.

(3) The soldier will record his Vote on the Ballot paper and will then transmit it by post in the ordinary way.

(4) The Returning Officers, after an appointed date, will open and record the Votes on the Military Ballot papers, and add them to the Votes recorded at the ordinary civilian Election.

ALTERNATIVE PROCEDURE

As an alternative procedure to the soldier forwarding his Ballot paper through the post, the following might be adopted, but I think, taking all into consideration, it is not a preferable alternative.

(1) The Commanding Officer of the Unit shall distribute to the soldiers on one day the candidate's Election Addresses, and on the following day the Vote papers where it is practicable.

(2) The soldier will record his Vote and drop it into a Ballot-box in the presence of the Commanding or other Officer, who, for these purposes, will be a regimental Returning Officer. The regimental Returning Officer will forward the Ballot-boxes to an appointed place where the Votes will be counted and recorded by special Returning Officers, who will send forward the results by letter or telegram to the Local Government Board, who will distribute them to the appropriate Returning Officers in this country.

C. A.

26.5.'16.

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